

EQ-1-C2-1.ST25.txt
SEQUENCE LISTING

<110> Dowling, Patricia W.
Youngner, Julius S.

<120> COLD-ADAPTED EQUINE INFLUENZA VIRUSES

<130> EQ-1-C2-1

<140> 10/065,133
<141> 2002-09-19

<150> PCT/US99/18583
<151> 1999-08-12

<150> 09/133,921
<151> 1998-08-13

<160> 108

<170> PatentIn version 3.1

<210> 1
<211> 1023
<212> DNA
<213> Equi

<220>
<221> CDS
<222> (25)..(780)
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<220>
<221> misc_feature
<222> (673)..(673)
<223> At nucleotide 673, r = a or g
      At amino acid residue 213, Xaa = Val
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<400> 1
gcaaaagcag gtagatattt aaag atg agt ctt ctg acc gag gtc gaa acg . 51
Met Ser Leu Leu Thr Glu Val Glu Thr
1 5

tac gtt ctc tct atc gta cca tca ggc ccc ctc aaa gcc gag atc gcg 99
 Tyr Val Leu Ser Ile Val Pro Ser Gly Pro Leu Lys Ala Glu Ile Ala
 10 15 20 25

cag aga ctt gaa gat gtc ttt gca ggg aag aac acc gat ctt gag gca 147
 Gln Arg Leu Glu Asp Val Phe Ala Gly Lys Asn Thr Asp Leu Glu Ala
 30 35 40

ctc atg gaa tgg cta aag aca aga cca atc ctg tca cct ctg act aaa
 Leu Met Glu Trp Leu Lys Thr Arg Pro Ile Leu Ser Pro Leu Thr Lys
 45 50 55

ggg att tta gga ttc gta ttc acg ctc acc gtg ccc agt gag cga gga 243
 Gly Ile Leu Gly Phe Val Phe Thr Leu Thr Val Pro Ser Glu Arg Gly
 60 65 70

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| | |
|---|------|
| ctg cag cgt aga cgc ttt gtc caa aat gcc ctt agt gga aac gga gat Leu Gln Arg Arg Arg Phe Val Gln Asn Ala Leu Ser Gly Asn Gly Asp 75 80 85 | 291 |
| cca aac aac atg gac aga gca gta aaa ctg tac agg aag ctt aaa aga Pro Asn Asn Met Asp Arg Ala Val Lys Leu Tyr Arg Lys Leu Lys Arg 90 95 100 105 | 339 |
| gaa ata aca ttc cat ggg gca aaa gag gtg gca ctc agc tat tcc act Glu Ile Thr Phe His Gly Ala Lys Glu Val Ala Leu Ser Tyr Ser Thr 110 115 120 | 387 |
| ggt gca cta gcc agc tgc atg gga ctc ata tac aac aga atg gga act Gly Ala Leu Ala Ser Cys Met Gly Leu Ile Tyr Asn Arg Met Gly Thr 125 130 135 | 435 |
| gtg aca acc gaa gtg gca ttt ggc ctg gta tgc gcc aca tgt gaa cag Val Thr Thr Glu Val Ala Phe Gly Leu Val Cys Ala Thr Cys Glu Gln 140 145 150 | 483 |
| atc gct gat tcc cag cat cga tct cac agg cag atg gtg aca aca acc Ile Ala Asp Ser Gln His Arg Ser His Arg Gln Met Val Thr Thr Thr 155 160 165 | 531 |
| aac cca tta atc aga cat gaa aac aga atg gta tta gcc agt acc acg Asn Pro Leu Ile Arg His Glu Asn Arg Met Val Leu Ala Ser Thr Thr 170 175 180 185 | 579 |
| gct aaa gcc atg gag cag atg gca ggg tcg agt gag cag gca gca gag Ala Lys Ala Met Glu Gln Met Ala Gly Ser Ser Glu Gln Ala Ala Glu 190 195 200 | 627 |
| gcc atg gag gtt gct agt aag gct agg cag atg gtr cag gca atg aga Ala Met Glu Val Ala Ser Lys Ala Arg Gln Met Xaa Gln Ala Met Arg 205 -210 215 | 675 |
| acc att ggg acc cac cct agc tcc agt gcc ggt ttg aaa gat gat ctc Thr Ile Gly Thr His Pro Ser Ser Ser Ala Gly Leu Lys Asp Asp Leu 220 225 230 | 723 |
| ctt gaa aat ttg cag gcc tac cag aaa cgg atg gga gtg caa atg cag Leu Glu Asn Leu Gln Ala Tyr Gln Lys Arg Met Gly Val Gln Met Gln 235 240 245 | 771 |
| cga ttc aag tgatcctctc gttattgcag caagtatcat tggatcttg Arg Phe Lys 250 | 820 |
| cacttgatat tgtggattct tgatgcctt ttcttcaaatt tcatttatcg tcgccttaaa | 880 |
| tacgggttga aaagagggcc ttctacggaa ggagtacctg agtctatgag ggaagaatat | 940 |
| cggcaggaac agcagaatgc tgtggatgtt gacgatggtc attttgtcaa catagagctg | 1000 |
| gagtaaaaaa ctaccttgtt tct | 1023 |

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<211> 252

<212> PRT

<213> Equine influenza virus H3N8

<220>

<221> misc_feature

<222> (213)..(213)

<223> The 'Xaa' at location 213 stands for Val.

<400> 2

Met Ser Leu Leu Thr Glu Val Glu Thr Tyr Val Leu Ser Ile Val Pro
1 5 10 15

Ser Gly Pro Leu Lys Ala Glu Ile Ala Gln Arg Leu Glu Asp Val Phe
20 25 30

Ala Gly Lys Asn Thr Asp Leu Glu Ala Leu Met Glu Trp Leu Lys Thr
35 40 45

Arg Pro Ile Leu Ser Pro Leu Thr Lys Gly Ile Leu Gly Phe Val Phe
50 55 60

Thr Leu Thr Val Pro Ser Glu Arg Gly Leu Gln Arg Arg Arg Phe Val
65 70 75 80

Gln Asn Ala Leu Ser Gly Asn Gly Asp Pro Asn Asn Met Asp Arg Ala
85 90 95

Val Lys Leu Tyr Arg Lys Leu-Lys Arg Glu Ile Thr Phe His Gly Ala
100 105 110

Lys Glu Val Ala Leu Ser Tyr Ser Thr Gly Ala Leu Ala Ser Cys Met
115 120 125

Gly Leu Ile Tyr Asn Arg Met Gly Thr Val Thr Thr Glu Val Ala Phe
130 135 140

Gly Leu Val Cys Ala Thr Cys Glu Gln Ile Ala Asp Ser Gln His Arg
145 150 155 160

Ser His Arg Gln Met Val Thr Thr Asn Pro Leu Ile Arg His Glu
165 170 175

Asn Arg Met Val Leu Ala Ser Thr Thr Ala Lys Ala Met Glu Gln Met
180 185 190

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Ala Gly Ser Ser Glu Gln Ala Ala Glu Ala Met Glu Val Ala Ser Lys
 195 200 205

Ala Arg Gln Met Xaa Gln Ala Met Arg Thr Ile Gly Thr His Pro Ser
 210 215 220

Ser Ser Ala Gly Leu Lys Asp Asp Leu Leu Glu Asn Leu Gln Ala Tyr
 225 230 235 240

Gln Lys Arg Met Gly Val Gln Met Gln Arg Phe Lys
 245 250

<210> 3
 <211> 756
 <212> DNA
 <213> Equine influenza virus H3N8

| | |
|--|-----|
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| aaagccgaga tcgcgcagag acttgaagat gtctttgcag ggaagaacac cgatcttgag | 120 |
| gcactcatgg aatggctaaa gacaagacca atcctgtcac ctctgactaa agggatttta | 180 |
| ggattcgtat tcacgctcac cgtgccagt gagcgaggac tgcagcgtag acgctttgtc | 240 |
| caaaatgccc ttagtgaaa cggagatcca aacaacatgg acagagcagt aaaactgtac | 300 |
| aggaagctta aaagagaaat aacattccat ggggcaaaag aggtggcact cagctattcc | 360 |
| actggtgtcac tagccagctg catgggactc atatacaaca gaatggAAC tgtgacaacc | 420 |
| gaagtggcat ttggcctggat atgcgccaca tgtgaacaga tcgctgattc ccagcatcga | 480 |
| tctcacaggc agatggtgac aacaaccaac ccattaatca gacatgaaaa cagaatggta | 540 |
| ttagccagta ccacggctaa agccatggag cagatggcag ggtcgagtga gcaggcagca | 600 |
| gaggccatgg aggttgctag taaggctagg cagatggtrc aggcaatgag aaccattggg | 660 |
| acccacccta gctccagtgc cggtttgaaa gatgatctcc ttgaaaattt gcaggcctac | 720 |
| cagaaacgga tgggagtgca aatgcagcga ttcaag | 756 |

<210> 4
 <211> 1023
 <212> DNA
 <213> Equine influenza virus H3N8

<220>
 <221> CDS
 <222> (25)..(780)
 <223>

EO-1-C2-1.ST25.txt

<400> 4
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 Met Ser Leu Leu Thr Glu Val Glu Thr
 1 5

 tac gtt ctc tct atc tta cca tca ggc ccc ctc aaa gcc gag atc gcg 99
 Tyr Val Leu Ser Ile Leu Pro Ser Gly Pro Leu Lys Ala Glu Ile Ala
 10 15 20 25

 cag aga ctt gaa gat gtc ttt gca ggg aag aac acc gat ctt gag gca 147
 Gln Arg Leu Glu Asp Val Phe Ala Gly Lys Asn Thr Asp Leu Glu Ala
 30 35 40

 ctc atg gaa tgg cta aag aca aga cca atc ctg tca cct ctg act aaa 195
 Leu Met Glu Trp Leu Lys Thr Arg Pro Ile Leu Ser Pro Leu Thr Lys
 45 50 55

 ggg att tta gga ttc gta ttc acg ctc acc gtg ccc agt gag cga gga 243
 Gly Ile Leu Gly Phe Val Phe Thr Leu Thr Val Pro Ser Glu Arg Gly
 60 65 70

 ctg cag cgt aga cgc ttt gtc caa aat gcc ctt agt gga aac gga gat 291
 Leu Gln Arg Arg Arg Phe Val Gln Asn Ala Leu Ser Gly Asn Gly Asp
 75 80 85

 cca aac aac atg gac aga gca gta aaa ctg tac agg aag ctt aaa aga 339
 Pro Asn Asn Met Asp Arg Ala Val Lys Leu Tyr Arg Lys Leu Lys Arg
 90 95 100 105

 gaa ata aca ttc cat ggg gca aaa gag gtg gca ctc agc tat tcc act 387
 Glu Ile Thr Phe His Gly Ala Lys Glu Val Ala Leu Ser Tyr Ser Thr
 110 115 120

 ggt gca cta gcc agc tgc atg gga ctc ata tac aac aga atg gga act 435
 Gly Ala Leu Ala Ser Cys Met Gly Leu Ile Tyr Asn Arg Met Gly Thr
 125 130 135

 gtg aca acc gaa gtg gca ttt ggc ctg gta tgc gcc aca tgt gaa cag 483
 Val Thr Thr Glu Val Ala Phe Gly Leu Val Cys Ala Thr Cys Glu Gln
 140 145 150

 atc gct gat tcc cag cat cga tct cac agg cag atg gtg aca ata acc 531
 Ile Ala Asp Ser Gln His Arg Ser His Arg Gln Met Val Thr Ile Thr
 155 160 165

 aac cca tta atc aga cat gaa aac aga atg gta tta gcc agt acc acg 579
 Asn Pro Leu Ile Arg His Glu Asn Arg Met Val Leu Ala Ser Thr Thr
 170 175 180 185

 gct aaa gcc atg gag cag atg gca ggg tcg agt gag cag gca gca gag 627
 Ala Lys Ala Met Glu Gln Met Ala Gly Ser Ser Glu Gln Ala Ala Glu
 190 195 200

 gcc atg gag gtt gct agt aag gct agg cag atg gta cag gca atg aga 675
 Ala Met Glu Val Ala Ser Lys Ala Arg Gln Met Val Gln Ala Met Arg
 205 210 215

 acc att ggg acc cac cct agc tcc agt gcc ggt ttg aaa gat gat ctc 723

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Thr Ile Gly Thr His Pro Ser Ser Ser Ala Gly Leu Lys Asp Asp Leu
220 225 230

ctt gaa aat ttg cag gcc tac cag aaa cgg atg gga gtg caa atg cag 771
Leu. Glu Asn Leu Gln Ala Tyr Gln Lys Arg Met Gly Val Gln Met Gln
235 240 245

cga ttc aag tgatcccttc gttattgcag caagtatcat tggatcttg 820
Arg Phe Lys
250

cacttgatat tgtggattct tgatcgccctt ttcttcaaatt tcatttatcg tcgccttaaa 880
tacggcttga aaagagggcc ttctacggaa ggagtacctg agtctatgag ggaagaatat 940
cggcaggaac agcagaatgc tgtggatgtt gacgatggtc attttgtcaa catagagctg 1000
gagtaaaaaa ctaccttgtt tct 1023

<210> 5
<211> 252
<212> PRT
<213> Equine influenza virus H3N8

<400> 5

Met Ser Leu Leu Thr Glu Val Glu Thr Tyr Val Leu Ser Ile Leu Pro
1 5 10 15

Ser Gly Pro Leu Lys Ala Glu Ile Ala Gln Arg Leu Glu Asp Val Phe
20 25 30

Ala Gly Lys Asn Thr Asp Leu Glu Ala Leu Met Glu Trp Leu Lys Thr
35 40 45

Arg Pro Ile Leu Ser Pro Leu Thr Lys Gly Ile Leu Gly Phe Val Phe
50 55 60

Thr Leu Thr Val Pro Ser Glu Arg Gly Leu Gln Arg Arg Arg Phe Val
65 70 75 80

Gln Asn Ala Leu Ser Gly Asn Gly Asp Pro Asn Asn Met Asp Arg Ala
85 90 95

Val Lys Leu Tyr Arg Lys Leu Lys Arg Glu Ile Thr Phe His Gly Ala
100 105 110

Lys Glu Val Ala Leu Ser Tyr Ser Thr Gly Ala Leu Ala Ser Cys Met
115 120 125

EQ-1-C2-1.ST25.txt

Gly Leu Ile Tyr Asn Arg Met Gly Thr Val Thr Glu Val Ala Phe
 130 135 140

Gly Leu Val Cys Ala Thr Cys Glu Gln Ile Ala Asp Ser Gln His Arg
 145 150 155 160

Ser His Arg Gln Met Val Thr Ile Thr Asn Pro Leu Ile Arg His Glu
 165 170 175

Asn Arg Met Val Leu Ala Ser Thr Thr Ala Lys Ala Met Glu Gln Met
 180 185 190

Ala Gly Ser Ser Glu Gln Ala Ala Glu Ala Met Glu Val Ala Ser Lys
 195 200 205

Ala Arg Gln Met Val Gln Ala Met Arg Thr Ile Gly Thr His Pro Ser
 210 215 220

Ser Ser Ala Gly Leu Lys Asp Asp Leu Leu Glu Asn Leu Gln Ala Tyr
 225 230 235 240

Gln Lys Arg Met Gly Val Gln Met Gln Arg Phe Lys
 245 250

<210> 6

<211> 756

<212> DNA

<213> Equine influenza virus H3N8

<400> 6

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aaagccgaga tcgcgcagag acttgaagat gtctttgcag ggaagaacac cgatcttgag 120

gcactcatgg aatggctaaa gacaagacca atcctgtcac ctctgactaa agggattta 180

ggattcgtat tcacgctcac cgtgcccagt gagcgaggac tgcagcgttag acgctttgtc 240

caaaatgccc ttagtgaaaa cggagatcca aacaacatgg acagagcagt aaaactgtac 300

aggaagctta aaagagaaaat aacattccat gggcaaaag aggtggcact cagctattcc 360

actgggtcac tagccagctg catgggactc atataacaaca gaatgggaac tgtgacaacc 420

gaagtggcat ttggcctggat atgcgccaca tgtgaacaga tgcgtgattc ccagcatcga 480

tctcacaggc agatggtgac aataaccaac ccattaatca gacatgaaaa cagaatggta 540

ttagccagta ccacggctaa agccatggag cagatggcag ggtcgagtga gcaggcagca 600

gaggccatgg aggttgctag taaggctagg cagatggtac aggcaatgag aaccattggg 660

EO-1-C2-1.ST25.txt

EQ-1-C2-1.ST25.txt

| | | | |
|---|-----|-----|------|
| Ser Cys Lys Arg Gly Ser Ala Asp Ser Phe Phe Ser Arg Leu Asn Trp | | | |
| 155 | 160 | 165 | |
| cta aca gaa tct gga aac tct tac ccc aca ttg aat gtg aca atg cct | | | 581 |
| Leu Thr Glu Ser Gly Asn Ser Tyr Pro Thr Leu Asn Val Thr Met Pro | | | |
| 170 | 175 | 180 | |
| aac aat aaa aat ttc gac aaa cta tac atc tgg ggg att cat cac ccg | | | 629 |
| Asn Asn Lys Asn Phe Asp Lys Leu Tyr Ile Trp Gly Ile His His Pro | | | |
| 185 | 190 | 195 | 200 |
| agc tca aac aaa gag cag aca aaa ttg tac atc caa gaa tcg gga cga | | | 677 |
| Ser Ser Asn Lys Glu Gln Thr Lys Leu Tyr Ile Gln Glu Ser Gly Arg | | | |
| 205 | 210 | 215 | |
| gta aca gtc tca aca aaa aga agt caa caa aca ata atc cct aac atc | | | 725 |
| Val Thr Val Ser Thr Lys Arg Ser Gln Gln Thr Ile Ile Pro Asn Ile | | | |
| 220 | 225 | 230 | |
| gga tct aga ccg cgg gtc agg ggt caa tca ggc agg ata agc ata tac | | | 773 |
| Gly Ser Arg Pro Arg Val Arg Gly Gln Ser Gly Arg Ile Ser Ile Tyr | | | |
| 235 | 240 | 245 | |
| tgg acc att gta aaa cct gga gat atc cta atg ata aac agt aat ggc | | | 821 |
| Trp Thr Ile Val Lys Pro Gly Asp Ile Leu Met Ile Asn Ser Asn Gly | | | |
| 250 | 255 | 260 | |
| aac tta gtt gca ccg cgg gga tat ttt aaa ttg aaa aca ggg aaa agc | | | 869 |
| Asn Leu Val Ala Pro Arg Gly Tyr Phe Lys Leu Lys Thr Gly Lys Ser | | | |
| 265 | 270 | 275 | 280 |
| tct gta atg aga tca gat gca ccc ata gac att tgt gtg tct gaa tgt | | | 917 |
| Ser Val Met Arg Ser Asp Ala Pro Ile Asp Ile Cys Val Ser Glu Cys | | | |
| 285 | 290 | 295 | |
| att áca cca aat gga agc atc ccc aac gac aaa cca ttt caa aat gtg | | | 965 |
| Ile Thr Pro Asn Gly Ser Ile Pro Asn Asp Lys Pro Phe Gln Asn Val | | | |
| 300 | 305 | 310 | |
| aac aaa gtt aca tat gga aaa tgc ccc aag tat atc agg caa aac act | | | 1013 |
| Asn Lys Val Thr Tyr Gly Lys Cys Pro Lys Tyr Ile Arg Gln Asn Thr | | | |
| 315 | 320 | 325 | |
| tta aag ctg gcc act ggg atg agg aat gta cca gaa aag caa atc aga | | | 1061 |
| Leu Lys Leu Ala Thr Gly Met Arg Asn Val Pro Glu Lys Gln Ile Arg | | | |
| 330 | 335 | 340 | |
| gga atc ttt gga gca ata gcg gga ttc ata gaa aac ggc tgg gaa gga | | | 1109 |
| Gly Ile Phe Gly Ala Ile Ala Gly Phe Ile Glu Asn Gly Trp Glu Gly | | | |
| 345 | 350 | 355 | 360 |
| atg gtt gat ggg tgg tat gga ttc cga tat caa aac tcg gaa gga aca | | | 1157 |
| Met Val Asp Gly Trp Tyr Gly Phe Arg Tyr Gln Asn Ser Glu Gly Thr | | | |
| 365 | 370 | 375 | |
| gga caa gct gca gat cta aag agc act caa gca gcc atc gac cag atc | | | 1205 |
| Gly Gln Ala Ala Asp Leu Lys Ser Thr Gln Ala Ala Ile Asp Gln Ile | | | |
| 380 | 385 | 390 | |

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| | |
|---|------|
| aat gga aaa tta aac aga gtg att gaa agg acc aat gag aaa ttc cat Asn Gly Lys Leu Asn Arg Val Ile Glu Arg Thr Asn Glu Lys Phe His 395 400 405 | 1253 |
| caa ata gag aag gaa ttc tca gaa gta gaa ggg agg atc cag gac ttg Gln Ile Glu Lys Glu Phe Ser Glu Val Glu Gly Arg Ile Gln Asp Leu 410 415 420 | 1301 |
| gag aag tat gta gaa gac acc aaa ata gac cta tgg tcc tac aat gca Glu Lys Tyr Val Glu Asp Thr Lys Ile Asp Leu Trp Ser Tyr Asn Ala 425 430 435 440 | 1349 |
| gaa ttg ctg gtg gct cta aaa aat caa cat aca att gac tta aca gat Glu Leu Leu Val Ala Leu Lys Asn Gln His Thr Ile Asp Leu Thr Asp 445 450 455 | 1397 |
| gca gaa atg aat aaa tta ttc gag aag act aga cgc cag tta aga gaa Ala Glu Met Asn Lys Leu Phe Glu Lys Thr Arg Arg Gln Leu Arg Glu 460 465 470 | 1445 |
| aac gcg gaa gac atg gga ggt gga tgt ttc aag ata tac cac aaa tgt Asn Ala Glu Asp Met Gly Gly Cys Phe Lys Ile Tyr His Lys Cys 475 480 485 | 1493 |
| gat aat gca tgc att gga tca ata aga aat ggg aca tat gac cat tac Asp Asn Ala Cys Ile Gly Ser Ile Arg Asn Gly Thr Tyr Asp His Tyr 490 495 500 | 1541 |
| ata tac aga gat gaa gca tta aac aac cgg ttt caa atc aaa ggt gtt Ile Tyr Arg Asp Glu Ala Leu Asn Asn Arg Phe Gln Ile Lys Gly Val 505 510 515 520 | 1589 |
| gag ttg aaa tca ggc tac aaa gat tgg ata ctg tgg att tca ttc gcc Glu Leu Lys Ser Gly Tyr Lys Asp Trp Ile Leu Trp Ile Ser Phe Ala 525 530 535 | 1637 |
| ata tca tgc ttc tta att tgc gtt gtt cta ttg ggt ttc att atg tgg Ile Ser Cys Phe Leu Ile Cys Val Val Leu Leu Gly Phe Ile Met Trp 540 545 550 | 1685 |
| gct tgc caa aaa ggc aac atc aga tgc aac att tgc att tgagtaaact Ala Cys Gln Lys Gly Asn Ile Arg Cys Asn Ile Cys Ile 555 560 565 | 1734 |
| gatagttaaa aacacccttg tttctact | 1762 |

<210> 8
<211> 565
<212> PRT
<213> Equine influenza virus H3N8

<400> 8

Met Lys Thr Thr Ile Ile Leu Ile Pro Leu Thr His Trp Val Tyr Ser
1 5 10 15

Gln Asn Pro Thr Ser Gly Asn Asn Thr Ala Thr Leu Cys Leu Gly His

His Ala Val Ala Asn Gly Thr Leu Val Lys Thr Ile Thr Asp Asp Gln
35 40 45

Ile Glu Val Thr Asn Ala Thr Glu Leu Val Gln Ser Ile Ser Ile Gly
50 55 60

Lys Ile Cys Asn Asn Ser Tyr Arg Val Leu Asp Gly Arg Asn Cys Thr
65 70 75 80

Leu Ile Asp Ala Met Leu Gly Asp Pro His Cys Asp Val Phe Gln Tyr
85 90 95

Glu Asn Trp Asp Leu Phe Ile Glu Arg Ser Ser Ala Phe Ser Ser Cys
100 105 110

Tyr Pro Tyr Asp Ile Pro Asp Tyr Ala Ser Leu Arg Ser Ile Val Ala
115 120 125

Ser Ser Gly Thr Leu Glu Phe Thr Ala Glu Gly Phe Thr Trp Thr Gly
130 135 140

Val Thr Gln Asn Gly Arg Ser Gly Ser Cys Lys Arg Gly Ser Ala Asp
145 150 155 160

Ser Phe Phe Ser Arg Leu Asn Trp Leu Thr Glu Ser Gly Asn Ser Tyr
165 170 175

Pro Thr Leu Asn Val Thr Met Pro Asn Asn Lys Asn Phe Asp Lys Leu
180 185 190

Tyr Ile Trp Gly Ile His His Pro Ser Ser Asn Lys Glu Gln Thr Lys
195 200 205

Leu Tyr Ile Gln Glu Ser Gly Arg Val Thr Val Ser Thr Lys Arg Ser
210 215 220

Gln Gln Thr Ile Ile Pro Asn Ile Gly Ser Arg Pro Arg Val Arg Gly
225 230 235 240

Gln Ser Gly Arg Ile Ser Ile Tyr Trp Thr Ile Val Lys Pro Gly Asp
245 250 255

EQ-1-C2-1.ST25.txt

Ile Leu Met Ile Asn Ser Asn Gly Asn Leu Val Ala Pro Arg Gly Tyr
260 265 270

Phe Lys Leu Lys Thr Gly Lys Ser Ser Val Met Arg Ser Asp Ala Pro
275 280 285

Ile Asp Ile Cys Val Ser Glu Cys Ile Thr Pro Asn Gly Ser Ile Pro
290 295 300

Asn Asp Lys Pro Phe Gln Asn Val Asn Lys Val Thr Tyr Gly Lys Cys
305 310 315 320

Pro Lys Tyr Ile Arg Gln Asn Thr Leu Lys Leu Ala Thr Gly Met Arg
325 330 335

Asn Val Pro Glu Lys Gln Ile Arg Gly Ile Phe Gly Ala Ile Ala Gly
340 345 350

Phe Ile Glu Asn Gly Trp Glu Gly Met Val Asp Gly Trp Tyr Gly Phe
355 360 365

Arg Tyr Gln Asn Ser Glu Gly Thr Gly Gln Ala Ala Asp Leu Lys Ser
370 375 380

Thr Gln Ala Ala Ile Asp Gln Ile Asn Gly Lys Leu Asn Arg Val Ile
385 390 395 400

Glu Arg Thr Asn Glu Lys Phe His Gln Ile Glu Lys Glu Phe Ser Glu
405 410 415

Val Glu Gly Arg Ile Gln Asp Leu Glu Lys Tyr Val Glu Asp Thr Lys
420 425 430

Ile Asp Leu Trp Ser Tyr Asn Ala Glu Leu Leu Val Ala Leu Lys Asn
435 440 445

Gln His Thr Ile Asp Leu Thr Asp Ala Glu Met Asn Lys Leu Phe Glu
450 455 460

Lys Thr Arg Arg Gln Leu Arg Glu Asn Ala Glu Asp Met Gly Gly
465 470 475 480

Cys Phe Lys Ile Tyr His Lys Cys Asp Asn Ala Cys Ile Gly Ser Ile
485 490 495

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Arg Asn Gly Thr Tyr Asp His Tyr Ile Tyr Arg Asp Glu Ala Leu Asn
500 505 510

Asn Arg Phe Gln Ile Lys Gly Val Glu Leu Lys Ser Gly Tyr Lys Asp
515 520 525

Trp Ile Leu Trp Ile Ser Phe Ala Ile Ser Cys Phe Leu Ile Cys Val
530 535 540

Val Leu Leu Gly Phe Ile Met Trp Ala Cys Gln Lys Gly Asn Ile Arg.
545 550 555 560

Cys Asn Ile Cys Ile
565

<210> 9
<211> 1695
<212> DNA
<213> Equine influenza virus H3N8

<400> 9
atgaagacaa ccattatttt gataccactg acccattggg tctacagtca aaacccaacc 60
agtggcaaca acacagccac attatgtctg ggacaccatg cagtagcaaa tggaacattg 120
gtaaaaacaa taactgatga ccaaatttag gtgacaaatg ctactgaatt agttcagagc 180
atttcaatag ggaaaatatg caacaactca tatagagttc tagatggaag aaattgcaca 240
ttaatagatg caatgctagg agaccccccac tgtgatgtct ttcagtatga gaattggac 300
ctcttcatag aaagaagcag cgcttcagc agttgctacc catatgacat ccctgactat 360
gcatcgctcc ggtccattgt agcatcctca ggaacattgg aattcacagc agagggattc 420
acatggacag gtgtcactca aaacggaaga agtggatcct gcaaaagggg atcagccat 480
agtttctta gccgactgaa ttggctaaca gaatctggaa actcttaccc cacattgaat 540
gtgacaatgc ctaacaataa aaatttcgac aaactataca tctggggat tcataccccg 600
agctcaaaca aagagcagac aaaattgtac atccaagaat cgggacgagt aacagtctca 660
acaaaaaagaa gtcaacaaac aataatccct aacatcgat ctagaccgac ggtcagggt 720
caatcaggca ggataagcat atactggacc attgtaaaac ctggagatat cctaattgata 780
aacagtaatg gcaacttagt tgcacccgcgg ggatatttt aattgaaaac agggaaaagc 840
tctgtaatga gatcagatgc acccatagac atttgtgtgt ctgaatgtat tacaccaaatt 900
ggaagcatcc ccaacgacaa accattcaa aatgtgaaca aagttacata tggaaaatgc 960

EO-1-C2-1.ST25.txt

cccaaggata tcaggcaaaa cactttaaag ctggccactg ggatgaggaa tgtaccagaa 1020
aagcaaatca gaggaatctt tggagaata gcgggattca tagaaaacgg ctgggaagga 1080
atggttgatg ggtggtatgg attccgatat caaaaactcgg aaggaacagg acaagctgca 1140
gatctaaaga gcactcaagc agccatcgac cagatcaatg gaaaattaaa cagagtgatt 1200
gaaaggacca atgagaaaatt ccatcaaata gagaaggaat tctcagaagt agaagggagg 1260
atccaggact tggagaagta tgtagaagac accaaaaatag acctatggtc ctacaatgca 1320
gaattgctgg tggctctaaa aaatcaacat acaattgact taacagatgc agaaatgaat 1380
aaattattcg agaagacttag acgccagttt agagaaaaacg cggaagacat gggaggtgga 1440
tgtttcaaga tataccacaa atgtgataat gcatgcattt gatcaataag aaatgggaca 1500
tatgaccatt acatatacag agatgaagca ttaaacaacc ggtttcaaatt caaagggttt 1560
gagttgaaat caggctacaa agattggata ctgtggattt cattcgccat atcatgcttc 1620
ttaatttgcg ttgttctatt gggtttcatt atgtgggctt gccaaaaagg caacatcaga 1680
tgcaacattt gcatt 1695

<210> 10
<211> 1762
<212> DNA
<213> Equine influenza virus H3N8

<220>
<221> CDS
<222> (30)..(1724)
<223>

EQ-1-C2-1.ST25.txt

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| gtt cta gat gga aga aat tgc aca tta ata gat gca atg cta gga gac Val Leu Asp Gly Arg Asn Cys Thr Leu Ile Asp Ala Met Leu Gly Asp | 293 |
| 75 80 85 | |
| ccc cac tgt gat gtc ttt cag tat gag aat tgg gac ctc ttc ata gaa Pro His Cys Asp Val Phe Gln Tyr Glu Asn Trp Asp Leu Phe Ile Glu | 341 |
| 90 95 100 | |
| aga agc agc gct ttc agc agt tgc tac cca tat gac atc cct gac tat Arg Ser Ser Ala Phe Ser Ser Cys Tyr Pro Tyr Asp Ile Pro Asp Tyr | 389 |
| 105 110 115 120 | |
| gca tcg ctc cg ^g tcc att gta gca tcc tca gga aca ttg gaa ttc aca Ala Ser Leu Arg Ser Ile Val Ala Ser Ser Gly Thr Leu Glu Phe Thr | 437 |
| 125 130 135 | |
| gca gag gga ttc aca tgg aca ggt gtc act caa aac gga aga agt gga Ala Glu Gly Phe Thr Trp Thr Gly Val Thr Gln Asn Gly Arg Ser Gly | 485 |
| 140 145 150 | |
| tcc tgc aaa agg gaa tca gcc gat agt ttc ttt agc cga ctg aat ttg Ser Cys Lys Arg Glu Ser Ala Asp Ser Phe Phe Ser Arg Leu Asn Trp | 533 |
| 155 160 165 | |
| cta aca gaa tct gga aac tct tac ccc aca ttg aat gtg aca atg cct Leu Thr Glu Ser Gly Asn Ser Tyr Pro Thr Leu Asn Val Thr Met Pro | 581 |
| 170 175 180 | |
| aac aat aaa aat ttc gac aaa cta tac atc tgg ggg att cat cac ccg Asn Asn Lys Asn Phe Asp Lys Leu Tyr Ile Trp Gly Ile His His Pro | 629 |
| 185 190 195 200 | |
| agc tca aac aaa gag cag aca aaa ttg tac atc caa gaa tca gga cga Ser Ser Asn Lys Glu Gln Thr Lys Leu Tyr Ile Gln Glu Ser Gly Arg | 677 |
| 205 210 215 | |
| gta aca gtc tca aca aaa aga agt caa caa aca ata atc cct aac atc Val Thr Val Ser Thr Lys Arg Ser Gln Gln Thr Ile Ile Pro Asn Ile | 725 |
| 220 225 230 | |
| gga tct aga ccg tgg gtc agg ggt caa tca ggc agg ata agc ata tac Gly Ser Arg Pro Trp Val Arg Gly Gln Ser Gly Arg Ile Ser Ile Tyr | 773 |
| 235 240 245 | |
| tgg acc att gta aaa cct gga gat atc cta acg ata aac agt aat ggc Trp Thr Ile Val Lys Pro Gly Asp Ile Leu Thr Ile Asn Ser Asn Gly | 821 |
| 250 255 260 | |
| aac tta gtt gca ccg cgg gga tat ttt aaa ttg aaa aca ggg aaa agc Asn Leu Val Ala Pro Arg Gly Tyr Phe Lys Leu Lys Thr Gly Lys Ser | 869 |
| 265 270 275 280 | |
| tct gta atg aga tca gat gca ccc ata gac att tgt gtg tct gaa tgt Ser Val Met Arg Ser Asp Ala Pro Ile Asp Ile Cys Val Ser Glu Cys | 917 |
| 285 290 295 | |
| att aca cca aat gga agc atc ccc aac gac aaa cca ttt caa aat gtg Ile Thr Pro Asn Gly Ser Ile Pro Asn Asp Lys Pro Phe Gln Asn Val | 965 |
| 300 305 310 | |

EQ-1-C2-1.ST25.txt

| | |
|---|------|
| aac aaa gtt aca tat gga aaa tgc ccc aag tat atc agg caa aac act Asn Lys Val Thr Tyr Gly Lys Cys Pro Lys Tyr Ile Arg Gln Asn Thr 315 320 325 | 1013 |
| tta aag ctg gcc act ggg atg agg aat gta cca gaa aag caa atc aga Leu Lys Leu Ala Thr Gly Met Arg Asn Val Pro Glu Lys Gln Ile Arg 330 335 340 | 1061 |
| gga atc ttt gga gca ata gcg gga ttc ata gaa aac ggc tgg gaa gga Gly Ile Phe Gly Ala Ile Ala Gly Phe Ile Glu Asn Gly Trp Glu Gly 345 350 355 360 | 1109 |
| atg gtt gat ggg tgg tat gga ttc cga tat caa aac tcg gaa gga aca Met Val Asp Gly Trp Tyr Gly Phe Arg Tyr Gln Asn Ser Glu Gly Thr 365 370 375 | 1157 |
| gga caa gct gca gat cta aag agc act caa gca gcc atc gac cag atc Gly Gln Ala Ala Asp Leu Lys Ser Thr Gln Ala Ala Ile Asp Gln Ile 380 385 390 | 1205 |
| aat gga aaa tta aac aga gtg att gaa agg acc aat gag aaa ttc cat Asn Gly Lys Leu Asn Arg Val Ile Glu Arg Thr Asn Glu Lys Phe His 395 400 405 | 1253 |
| caa ata gag aag gaa ttc tca gaa gta gaa ggg aga atc cag gac ttg Gln Ile Glu Lys Glu Phe Ser Glu Val Glu Gly Arg Ile Gln Asp Leu 410 415 420 | 1301 |
| gag aag tat gta gaa gac acc aaa ata gac cta tgg tcc tac aat gca Glu Lys Tyr Val Glu Asp Thr Lys Ile Asp Leu Trp Ser Tyr Asn Ala 425 430 435 440 | 1349 |
| gaa ttg ctg gtg gct cta gaa aat caa cat aca att gac tta aca gat Glu Leu Leu Val Ala Leu Glu Asn Gln His Thr Ile Asp Leu Thr Asp 445 450 455 | 1397 |
| gca gaa atg aat aaa tta ttc gag aag act aga cgc cag tta aga gaa Ala Glu Met Asn Lys Leu Phe Glu Lys Thr Arg Arg Gln Leu Arg Glu 460 465 470 | 1445 |
| aac gcg gaa gac atg gga ggt gga tgt ttc aag ata tac cac aaa tgt Asn Ala Glu Asp Met Gly Gly Cys Phe Lys Ile Tyr His Lys Cys 475 480 485 | 1493 |
| gat aat gca tgc att gga tca ata aga aat ggg aca tat gac cat tac Asp Asn Ala Cys Ile Gly Ser Ile Arg Asn Gly Thr Tyr Asp His Tyr 490 495 500 | 1541 |
| ata tac aga gat gaa gca tta aac aac cgg ttt caa atc aaa ggt gtt Ile Tyr Arg Asp Glu Ala Leu Asn Arg Phe Gln Ile Lys Gly Val 505 510 515 520 | 1589 |
| gag ttg aaa tca ggc tac aaa gat tgg ata ctg tgg att tca ttc gcc Glu Leu Lys Ser Gly Tyr Lys Asp Trp Ile Leu Trp Ile Ser Phe Ala 525 530 535 | 1637 |
| ata tca tgc ttc tta att tgc gtt cta ttg ggt ttc att atg tgg Ile Ser Cys Phe Leu Ile Cys Val Val Leu Leu Gly Phe Ile Met Trp | 1685 |

EQ-1-C2-1.ST25.txt

540

545

550

gct tgc caa aaa ggc aac atc aga tgc aac att tgc att tgagtaaact 1734
 Ala Cys Gln Lys Gly Asn Ile Arg Cys Asn Ile Cys Ile
 555 560 565

gatagttaaa aacacccttg tttctact 1762

<210> 11
 <211> 565
 <212> PRT
 <213> Equine influenza virus H3N8

<400> 11

Met Lys Thr Thr Ile Ile Leu Ile Leu Leu Thr His Trp Val Tyr Ser
 1 5 10 15

Gln Asn Pro Thr Ser Gly Asn Asn Thr Ala Thr Leu Cys Leu Gly His
 20 25 30

His Ala Val Ala Asn Gly Thr Leu Val Lys Thr Ile Thr Asp Asp Gln
 35 40 45

Ile Glu Val Thr Asn Ala Thr Glu Leu Val Gln Ser Ile Ser Ile Gly
 50 55 60

Lys Ile Cys Asn Asn Ser Tyr Arg Val Leu Asp Gly Arg Asn Cys Thr
 65 70 75 80

Leu Ile Asp Ala Met Leu Gly Asp Pro His Cys Asp Val Phe Gln Tyr
 85 90 95

Glu Asn Trp Asp Leu Phe Ile Glu Arg Ser Ser Ala Phe Ser Ser Cys
 100 105 110

Tyr Pro Tyr Asp Ile Pro Asp Tyr Ala Ser Leu Arg Ser Ile Val Ala
 115 120 125

Ser Ser Gly Thr Leu Glu Phe Thr Ala Glu Gly Phe Thr Trp Thr Gly
 130 135 140

Val Thr Gln Asn Gly Arg Ser Gly Ser Cys Lys Arg Glu Ser Ala Asp
 145 150 155 160

Ser Phe Phe Ser Arg Leu Asn Trp Leu Thr Glu Ser Gly Asn Ser Tyr
 165 170 175

EQ-1-C2-1.ST25.txt

Pro Thr Leu Asn Val Thr Met Pro Asn Asn Lys Asn Phe Asp Lys Leu
180 185 190

Tyr Ile Trp Gly Ile His His Pro Ser Ser Asn Lys Glu Gln Thr Lys
195 200 205

Leu Tyr Ile Gln Glu Ser Gly Arg Val Thr Val Ser Thr Lys Arg Ser
210 215 220

Gln Gln Thr Ile Ile Pro Asn Ile Gly Ser Arg Pro Trp Val Arg Gly
225 230 235 240

Gln Ser Gly Arg Ile Ser Ile Tyr Trp Thr Ile Val Lys Pro Gly Asp
245 250 255

Ile Leu Thr Ile Asn Ser Asn Gly Asn Leu Val Ala Pro Arg Gly Tyr
260 265 270

Phe Lys Leu Lys Thr Gly Lys Ser Ser Val Met Arg Ser Asp Ala Pro
275 280 285

Ile Asp Ile Cys Val Ser Glu Cys Ile Thr Pro Asn Gly Ser Ile Pro
290 295 300

Asn Asp Lys Pro Phe Gln Asn Val Asn Lys Val Thr Tyr Gly Lys Cys
305 310 315 320

Pro Lys Tyr Ile Arg Gln Asn Thr Leu Lys Leu Ala Thr Gly Met Arg
325 330 335

Asn Val Pro Glu Lys Gln Ile Arg Gly Ile Phe Gly Ala Ile Ala Gly
340 345 350

Phe Ile Glu Asn Gly Trp Glu Gly Met Val Asp Gly Trp Tyr Gly Phe
355 360 365

Arg Tyr Gln Asn Ser Glu Gly Thr Gly Gln Ala Ala Asp Leu Lys Ser
370 375 380

Thr Gln Ala Ala Ile Asp Gln Ile Asn Gly Lys Leu Asn Arg Val Ile
385 390 395 400

Glu Arg Thr Asn Glu Lys Phe His Gln Ile Glu Lys Glu Phe Ser Glu
405 410 415

EQ-1-C2-1.ST25.txt

Val Glu Gly Arg Ile Gln Asp Leu Glu Lys Tyr Val Glu Asp Thr Lys
420 425 430

Ile Asp Leu Trp Ser Tyr Asn Ala Glu Leu Leu Val Ala Leu Glu Asn
435 440 445

Gln His Thr Ile Asp Leu Thr Asp Ala Glu Met Asn Lys Leu Phe Glu
450 455 460

Lys Thr Arg Arg Gln Leu Arg Glu Asn Ala Glu Asp Met Gly Gly Gly
465 470 475 480

Cys Phe Lys Ile Tyr His Lys Cys Asp Asn Ala Cys Ile Gly Ser Ile
485 490 495

Arg Asn Gly Thr Tyr Asp His Tyr Ile Tyr Arg Asp Glu Ala Leu Asn
500 505 510

Asn Arg Phe Gln Ile Lys Gly Val Glu Leu Lys Ser Gly Tyr Lys Asp
515 520 525

Trp Ile Leu Trp Ile Ser Phe Ala Ile Ser Cys Phe Leu Ile Cys Val
530 535 540

Val Leu Leu Gly Phe Ile Met Trp Ala Cys Gln Lys Gly Asn Ile Arg
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Cys Asn Ile Cys Ile
565

<210> 12
<211> 1695
<212> DNA
<213> Equine influenza virus H3N8

<400> 12
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gtaaaaacaa taactgatga ccaaatttag gtgacaaatg ctactgaatt agttcagagc 180
atttcaatag gaaaaatatg caacaactca tatagagttc tagatggaag aaattgcaca 240
ttaatagatg caatgctagg agaccccccac tgtgatgtct ttcagtatga gaattggac 300
ctcttcatag aaagaagcag cgctttcagc agttgctacc catatgacat ccctgactat 360

EQ-1-C2-1.ST25.txt

gcatcgctcc ggtccattgt agcatcctca ggaacattgg aattcacagc agagggattc 420
acatggacag gtgtcactca aaacggaaga agtggatcct gcaaaaggga atcagccgat 480
agttctta gccgactgaa ttggctaaca gaatctggaa actcttaccc cacattgaat 540
tgacaatgc ctaacaataa aaatttcgac aaactataca tctggggat tcaccccg 600
agctcaaaca aagagcagac aaaattgtac atccaagaat caggacgagt aacagtctca 660
acaaaaagaa gtcaacaaac aataatccct aacatcgat ctagaccgtg ggtcaggggt 720
caatcaggca ggataagcat atactggacc attgtaaaac ctggagatat cctaacgata 780
aacagtaatg gcaacttagt tgccacccgg ggatattttt aattgaaaac agggaaaagc 840
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ggaagcatcc ccaacgacaa accatttcaa aatgtgaaca aagttacata tggaaaatgc 960
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gaaaggacca atgagaaatt ccatcaaata gagaaggaat tctcagaagt agaagggaga 1260
atccaggact tggagaagta tgtagaagac accaaaatag acctatggtc ctacaatgca 1320
gaattgctgg tggctctaga aaatcaacat acaattgact taacagatgc agaaatgaat 1380
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tgtttcaaga tataccacaa atgtgataat gcatgcattt gatcaataag aaatggaca 1500
tatgaccatt acatatacag agatgaagca ttaaacaacc ggtttcaaata caaagggttt 1560
gagttgaaat caggctacaa agattggata ctgtggattt cattcgccat atcatgcttc 1620
ttaatttgcg ttgttctatt gggtttcatt atgtggcattt gccaaaaagg caacatcaga 1680
tgcaacattt gcatt 1695

<210> 13
<211> 1241
<212> DNA
<213> Equine influenza virus H3N8

<220>
<221> CDS
<222> (28) .. (1239)
<223>

EQ-1-C2-1.ST25.txt

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 Met Glu Arg Ile Lys Glu Leu Arg Asp
 1 5

 cta atg tca caa tcc cgc acc cgc gag ata cta aca aaa act act gtg 102
 Leu Met Ser Gln Ser Arg Thr Arg Glu Ile Leu Thr Lys Thr Thr Val
 10 15 20 25

 gac cac atg gcc ata atc aag aaa tac aca tca gga aga caa gag aag 150
 Asp His Met Ala Ile Ile Lys Lys Tyr Thr Ser Gly Arg Gln Glu Lys
 30 35 40

 aac ccc gca ctt agg atg aag tgg atg atg gca atg aaa tac cca att 198
 Asn Pro Ala Leu Arg Met Lys Trp Met Met Ala Met Lys Tyr Pro Ile
 45 50 55

 aca gca gat aag agg ata atg gaa atg att cct gag aga aat gaa cag 246
 Thr Ala Asp Lys Arg Ile Met Glu Met Ile Pro Glu Arg Asn Glu Gln
 60 65 70

 ggg caa acc ctt tgg agc aaa acg aac gat gct ggc tca gac cgc gta 294
 Gly Gln Thr Leu Trp Ser Lys Thr Asn Asp Ala Gly Ser Asp Arg Val
 75 80 85

 atg gta tca cct ctg gca gtg aca tgg tgg aat agg aat gga cca aca 342
 Met Val Ser Pro Leu Ala Val Thr Trp Trp Asn Arg Asn Gly Pro Thr
 90 95 100 105

 acg agc aca att cat tat cca aaa gtc tac aaa act tat ttt gaa aaa 390
 Thr Ser Thr Ile His Tyr Pro Lys Val Tyr Lys Thr Tyr Phe Glu Lys
 110 115 120

 gtt gaa aga tta aaa cac gga acc ttt ggc ccc gtt cat ttt agg aat 438
 Val Glu Arg Leu Lys His Gly Thr Phe Gly Pro Val His Phe Arg Asn
 125 130 135

 caa gtc aag ata aga cgg aga gtt gat gta aac cct ggt cac gcg gac 486
 Gln Val Lys Ile Arg Arg Arg Val Asp Val Asn Pro Gly His Ala Asp
 140 145 150

 ctc agt gcc aaa gaa gca caa gat gtg atc atg gaa gtt gtt ttc cca 534
 Leu Ser Ala Lys Glu Ala Gln Asp Val Ile Met Glu Val Val Phe Pro
 155 160 165

 aat gaa gtg gga gcc aga att cta aca tcg gaa tca caa cta aca ata 582
 Asn Glu Val Gly Ala Arg Ile Leu Thr Ser Glu Ser Gln Leu Thr Ile
 170 175 180 185

 acc aaa gag aaa aaa gaa gaa ctt cag gac tgc aaa att gcc ccc ttg 630
 Thr Lys Glu Lys Lys Glu Glu Leu Gln Asp Cys Lys Ile Ala Pro Leu
 190 195 200

 atg gta gca tac atg cta gaa aga gag ttg gtc cga aaa aca aga ttc 678
 Met Val Ala Tyr Met Leu Glu Arg Glu Leu Val Arg Lys Thr Arg Phe
 205 210 215

 ctc cca gtg gct ggc gga aca agc agt gta tac att gaa gtg ttg cat 726
 Leu Pro Val Ala Gly Gly Thr Ser Ser Val Tyr Ile Glu Val Leu His

EQ-1-C2-1.ST25.txt

220

225

230

| | |
|---|------|
| ctg act cag gga aca tgc tgg gaa caa atg tac acc cca gga gga gaa Leu Thr Gln Gly Thr Cys Trp Glu Gln Met Tyr Thr Pro Gly Gly Glu 235 240 245 | 774 |
| gtt aga aac gat gac att gat caa agt tta att att gct gcc cg ^g aac Val Arg Asn Asp Asp Ile Asp Gln Ser Leu Ile Ile Ala Ala Arg Asn 250 255 260 265 | 822 |
| ata gtg aga aga gcg aca gta tca gca gat cca cta gca tcc ctg ctg Ile Val Arg Arg Ala Thr Val Ser Ala Asp Pro Leu Ala Ser Leu Leu 270 275 280 | 870 |
| gaa atg tgc cac agt aca cag att ggt gga ata agg atg gta gac atc Glu Met Cys His Ser Thr Gln Ile Gly Gly Ile Arg Met Val Asp Ile 285 290 295 | 918 |
| ctt aag cag aat cca aca gag gaa caa gct gtg gat ata tgc aaa gca Leu Lys Gln Asn Pro Thr Glu Gln Ala Val Asp Ile Cys Lys Ala 300 305 310 | 966 |
| gca atg ggg tta aga att agc tca tca ttc agc ttt ggt gga ttc acc Ala Met Gly Leu Arg Ile Ser Ser Phe Ser Phe Gly Gly Phe Thr 315 320 325 | 1014 |
| ttt aag aga aca agt gga tca tca gtc aag aga gaa gaa atg ctt Phe Lys Arg Thr Ser Gly Ser Ser Val Lys Arg Glu Glu Met Leu 330 335 340 345 | 1062 |
| acg ggc aac ctt caa aca ttg aaa ata aga gtg cat gaa ggc tat gaa Thr Gly Asn Leu Gln Thr Leu Lys Ile Arg Val His Glu Gly Tyr Glu 350 355 360 | 1110 |
| gaa ttc aca atg gtc gga aga aga gca aca gcc att ctc aga aag gca Glu Phe Thr Met Val Gly Arg Arg Ala Thr Ala Ile Leu Arg Lys Ala 365 370 375 | 1158 |
| acc aga aga ttg att caa ttg ata gta agt ggg aga gat gaa caa tca Thr Arg Arg Leu Ile Gln Leu Ile Val Ser Gly Arg Asp Glu Gln Ser 380 385 390 | 1206 |
| att gct gaa gca ata att gta gcc atg gtg ttt tc Ile Ala Glu Ala Ile Ile Val Ala Met Val Phe 395 400 | 1241 |

<210> 14
<211> 404
<212> PRT
<213> Equine influenza virus H3N8

<400> 14

| |
|--|
| Met Glu Arg Ile Lys Glu Leu Arg Asp Leu Met Ser Gln Ser Arg Thr 1 5 10 15 |
|--|

Arg Glu Ile Leu Thr Lys Thr Val Asp His Met Ala Ile Ile Lys

Lys Tyr Thr Ser Gly Arg Gln Glu Lys Asn Pro Ala Leu Arg Met Lys
35 40 45

Trp Met Met Ala Met Lys Tyr Pro Ile Thr Ala Asp Lys Arg Ile Met
50 55 60

Glu Met Ile Pro Glu Arg Asn Glu Gln Gly Gln Thr Leu Trp Ser Lys
65 70 75 80

Thr Asn Asp Ala Gly Ser Asp Arg Val Met Val Ser Pro Leu Ala Val
85 90 95

Thr Trp Trp Asn Arg Asn Gly Pro Thr Thr Ser Thr Ile His Tyr Pro
100 105 110

Lys Val Tyr Lys Thr Tyr Phe Glu Lys Val Glu Arg Leu Lys His Gly
115 120 125

Thr Phe Gly Pro Val His Phe Arg Asn Gln Val Lys Ile Arg Arg Arg
130 135 140

Val Asp Val Asn Pro Gly His Ala Asp Leu Ser Ala Lys Glu Ala Gln
145 150 155 160

Asp Val Ile Met Glu Val Val Phe Pro Asn Glu Val Gly Ala Arg Ile
165 170 175

Leu Thr Ser Glu Ser Gln Leu Thr Ile Thr Lys Glu Lys Lys Glu Glu
180 185 190

Leu Gln Asp Cys Lys Ile Ala Pro Leu Met Val Ala Tyr Met Leu Glu
195 200 205

Arg Glu Leu Val Arg Lys Thr Arg Phe Leu Pro Val Ala Gly Gly Thr
210 215 220

Ser Ser Val Tyr Ile Glu Val Leu His Leu Thr Gln Gly Thr Cys Trp
225 230 235 240

Glu Gln Met Tyr Thr Pro Gly Gly Glu Val Arg Asn Asp Asp Ile Asp
245 250 255

EQ-1-C2-1.ST25.txt

Gln Ser Leu Ile Ile Ala Ala Arg Asn Ile Val Arg Arg Ala Thr Val
 260 265 270

Ser Ala Asp Pro Leu Ala Ser Leu Leu Glu Met Cys His Ser Thr Gln
 275 280 285

Ile Gly Gly Ile Arg Met Val Asp Ile Leu Lys Gln Asn Pro Thr Glu
 290 295 300

Glu Gln Ala Val Asp Ile Cys Lys Ala Ala Met Gly Leu Arg Ile Ser
 305 310 315 320

Ser Ser Phe Ser Phe Gly Gly Phe Thr Phe Lys Arg Thr Ser Gly Ser
 325 330 335

Ser Val Lys Arg Glu Glu Glu Met Leu Thr Gly Asn Leu Gln Thr Leu
 340 345 350

Lys Ile Arg Val His Glu Gly Tyr Glu Glu Phe Thr Met Val Gly Arg
 355 360 365

Arg Ala Thr Ala Ile Leu Arg Lys Ala Thr Arg Arg Leu Ile Gln Leu
 370 375 380

Ile Val Ser Gly Arg Asp Glu Gln Ser Ile Ala Glu Ala Ile Ile Val
 385 390 395 400

Ala Met Val Phe

<210> 15
 <211> 1214
 <212> DNA
 <213> Equine influenza virus H3N8

| | | |
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| acaaaaacta ctgtggacca catggccata atcaagaaat acacatcagg aagacaagag | | 120 |
| aagaaccccg cacttaggat gaagtggatg atggcaatga aatacccaat tacagcagat | | 180 |
| aagaggataa tggaaatgat tcctgagaga aatgaacagg ggcaaaccct ttggagcaa | | 240 |
| acgaacgatg ctggctcaga ccgcgtaatg gtatcacctc tggcagtgac atggtgaa | | 300 |
| aggaatggac caacaacgag cacaattcat tatccaaaag tctacaaaac ttatggaa | | 360 |
| aaagttgaaa gattaaaaca cggaacctt ggccccgttc atttttagaa tcaagtcaag | | 420 |

EQ-1-C2-1.ST25.txt

ataagacgga gagttatgt aaaccctggt cacgcggacc tcagtgccaa agaagcacaa 480
gatgtatca tggaaaggatgt tttcccaaattt gaagtgggag ccagaattct aacatcgaa 540
tcacaactaa caataaccaa agagaaaaaa gaagaacttc aggactgcaa aattgcccc 600
ttgatggtag catacatgct agaaagagag ttggccgaa aaacaagatt cctcccagtg 660
gctggcggaa caagcagtgt atacattgaa gtgttgcattt tgactcaggg aacatgctgg 720
gaacaaatgt acaccccagg aggagaagtt agaaacgatg acattgatca aagtttaatt 780
attgctgccc ggaacatagt gagaagagcg acagtatcag cagatccact agcatccctg 840
ctggaaatgt gccacagtac acagattggt ggaataagga tggttagacat ccttaagcag 900
aatccaaacag aggaacaaggc tgtggatata tgcaaagcag caatgggtt aagaattagc 960
tcattcattca gcatttggtgg attcaccttt aagagaacaa gtggatcatc agtcaagaga 1020
gaagaagaaa tgcttacggg caaccccaa acattgaaaa taagagtgcata 1080
gaagaattca caatggtcgg aagaagagca acagccattc tcagaaaggc aaccagaaga 1140
ttgattcaat tgatagtaag tgggagagat gaacaatcaa ttgctgaagc aataattgtat 1200
gccatqqtat tttc 1214

<210> 16
<211> 1241
<212> DNA
<213> Equine influenza virus H3N8

<220>
<221> CDS
<222> (28)..(1239)
<223>

<400> 16
agcaaaaagca ggtcaaata tttcaat atg gag aga ata aaa gaa ctg aga gat 54
Met Glu Arg Ile Lys Glu Leu Arg Asp
1 5

ct a tg tca caa tcc cgc acc cgc gag ata cta aca aaa act act act gtg 102
 Leu Met Ser Gln Ser Arg Thr Arg Glu Ile Leu Thr Lys Thr Thr Val
 10 15 20 25

gac cac atg gcc ata atc aag aaa tac aca tca gga aga caa gag aag 150
 Asp His Met Ala Ile Ile Lys Lys Tyr Thr Ser Gly Arg Gln Glu Lys
 30 35 40

aac ccc gca ctt agg atg aag tgg atg atg gca atg aaa tac cca att
 Asn Pro Ala Leu Arg Met Lys Trp Met Met Ala Met Lys Tyr Pro Ile
 45 50 55

aca gca gat aag agg ata atg gaa atg att cct gag aga aat gaa cag 246

EQ-1-C2-1.ST25.txt

| | | | |
|---|-----|-----|-----|
| Thr Ala Asp Lys Arg Ile Met Glu Met Ile Pro Glu Arg Asn Glu Gln | | | |
| 60 | 65 | 70 | |
| ggg caa acc ctt tgg agc aaa acg aac gat gct ggc tca gac cgc gta | | | 294 |
| Gly Gln Thr Leu Trp Ser Lys Thr Asn Asp Ala Gly Ser Asp Arg Val | | | |
| 75 | 80 | 85 | |
| atg gta tca cct ctg gca gtg aca tgg tgg aat agg aat gga cca aca | | | 342 |
| Met Val Ser Pro Leu Ala Val Thr Trp Trp Asn Arg Asn Gly Pro Thr | | | |
| 90 | 95 | 100 | 105 |
| acg agc aca att cat tat cca aaa gtc cac aaa act tat ttt gaa aaa | | | 390 |
| Thr Ser Thr Ile His Tyr Pro Lys Val His Lys Thr Tyr Phe Glu Lys | | | |
| 110 | 115 | 120 | |
| gtt gaa aga tta aaa cac gga acc ttt ggc ccc gtt cat ttt agg aat | | | 438 |
| Val Glu Arg Leu Lys His Gly Thr Phe Gly Pro Val His Phe Arg Asn | | | |
| 125 | 130 | 135 | |
| caa gtc aag ata aga cgg aga gtt gat gta aac cct ggt cac gcg gac | | | 486 |
| Gln Val Lys Ile Arg Arg Val Asp Val Asn Pro Gly His Ala Asp | | | |
| 140 | 145 | 150 | |
| ctc agt gcc aaa gaa gca caa gat gtg atc atg gaa gtt gtt ttc cca | | | 534 |
| Leu Ser Ala Lys Glu Ala Gln Asp Val Ile Met Glu Val Val Phe Pro | | | |
| 155 | 160 | 165 | |
| aat gaa gtg gga gcc aga att cta aca tcg gaa tca caa cta aca ata | | | 582 |
| Asn Glu Val Gly Ala Arg Ile Leu Thr Ser Glu Ser Gln Leu Thr Ile | | | |
| 170 | 175 | 180 | 185 |
| acc aaa gag aaa aaa gaa gaa ctt cag gac tgc aaa att gcc ccc ttg | | | 630 |
| Thr Lys Glu Lys Glu Glu Leu Gln Asp Cys Lys Ile Ala Pro Leu | | | |
| 190 | 195 | 200 | |
| atg gta gca tac atg cta gaa aga gag ttg gtc cga aaa aca aga ttc | | | 678 |
| Met Val Ala Tyr Met Leu Glu Arg Glu Leu Val Arg Lys Thr Arg Phe | | | |
| 205 | 210 | 215 | |
| ctc cca gtg gct ggc gga aca agc agt gta tac att gaa gtg ttg cat | | | 726 |
| Leu Pro Val Ala Gly Gly Thr Ser Ser Val Tyr Ile Glu Val Leu His | | | |
| 220 | 225 | 230 | |
| ctg act cag gga aca tgc tgg gaa caa atg tac acc cca gga gga gaa | | | 774 |
| Leu Thr Gln Gly Thr Cys Trp Glu Gln Met Tyr Thr Pro Gly Gly Glu | | | |
| 235 | 240 | 245 | |
| gtt aga aac gat gac att gat caa agt tta att att gct gcc cg aac | | | 822 |
| Val Arg Asn Asp Asp Ile Asp Gln Ser Leu Ile Ile Ala Ala Arg Asn | | | |
| 250 | 255 | 260 | 265 |
| ata gtg aga aga gcg aca gta tca gca gat cca cta gca tcc ctg ctg | | | 870 |
| Ile Val Arg Arg Ala Thr Val Ser Ala Asp Pro Leu Ala Ser Leu Leu | | | |
| 270 | 275 | 280 | |
| gaa atg tgc cac agt aca cag att ggt gga ata agg atg gta gac atc | | | 918 |
| Glu Met Cys His Ser Thr Gln Ile Gly Gly Ile Arg Met Val Asp Ile | | | |
| 285 | 290 | 295 | |

EQ-1-C2-1.ST25.txt

| | | | | |
|---|-----|-----|------|------|
| ctt aag cag aat cca aca gag gaa caa gct gtg gat ata tgc aaa gca Leu Lys Gln Asn Pro Thr Glu Glu Gln Ala Val Asp Ile Cys Lys Ala 300 | 305 | 310 | 966 | |
| gca atg ggg tta aga att agc tca tca ttc agc ttt ggt gga ttc acc Ala Met Gly Leu Arg Ile Ser Ser Ser Phe Ser Phe Gly Gly Phe Thr 315 | 320 | 325 | 1014 | |
| ttt aag aga aca agt gga tca tca gtc aag aga gaa gaa gaa atg ctt Phe Lys Arg Thr Ser Gly Ser Ser Val Lys Arg Glu Glu Met Leu 330 | 335 | 340 | 345 | 1062 |
| acg ggc aac ctt caa aca ttg aaa ata aga gtg cat gaa ggc tat gaa Thr Gly Asn Leu Gln Thr Leu Lys Ile Arg Val His Glu Gly Tyr Glu 350 | 355 | 360 | | 1110 |
| gaa ttc aca atg gtc gga aga aga gca aca gcc att ctc aga aag gca Glu Phe Thr Met Val Gly Arg Arg Ala Thr Ala Ile Leu Arg Lys Ala 365 | 370 | 375 | | 1158 |
| acc aga aga ttg att caa ttg ata gta agt ggg aga gat gaa caa tca Thr Arg Arg Leu Ile Gln Leu Ile Val Ser Gly Arg Asp Glu Gln Ser 380 | 385 | 390 | | 1206 |
| att gct gaa gca ata att gta gcc atg gtg ttt tc Ile Ala Glu Ala Ile Ile Val Ala Met Val Phe 395 | 400 | | | 1241 |
| | | | | |
| <210> 17 | | | | |
| <211> 404 | | | | |
| <212> PRT | | | | |
| <213> Equine influenza virus H3N8 | | | | |
| | | | | |
| <400> 17 | | | | |
| Met Glu Arg Ile Lys Glu Leu Arg Asp Leu Met Ser Gln Ser Arg Thr 1 | 5 | 10 | 15 | |
| Arg Glu Ile Leu Thr Lys Thr Thr Val Asp His Met Ala Ile Ile Lys 20 | 25 | 30 | | |
| Lys Tyr Thr Ser Gly Arg Gln Glu Lys Asn Pro Ala Leu Arg Met Lys 35 | 40 | 45 | | |
| Trp Met Met Ala Met Lys Tyr Pro Ile Thr Ala Asp Lys Arg Ile Met 50 | 55 | 60 | | |
| Glu Met Ile Pro Glu Arg Asn Glu Gln Gly Gln Thr Leu Trp Ser Lys 65 | 70 | 75 | 80 | |
| Thr Asn Asp Ala Gly Ser Asp Arg Val Met Val Ser Pro Leu Ala Val 85 | 90 | 95 | | |

EQ-1-C2-1.ST25.txt

Thr Trp Trp Asn Arg Asn Gly Pro Thr Thr Ser Thr Ile His Tyr Pro
100 105 110

Lys Val His Lys Thr Tyr Phe Glu Lys Val Glu Arg Leu Lys His Gly
115 120 125

Thr Phe Gly Pro Val His Phe Arg Asn Gln Val Lys Ile Arg Arg Arg
130 135 140

Val Asp Val Asn Pro Gly His Ala Asp Leu Ser Ala Lys Glu Ala Gln
145 150 155 160

Asp Val Ile Met Glu Val Val Phe Pro Asn Glu Val Gly Ala Arg Ile
165 170 175

Leu Thr Ser Glu Ser Gln Leu Thr Ile Thr Lys Glu Lys Lys Glu Glu
180 185 190

Leu Gln Asp Cys Lys Ile Ala Pro Leu Met Val Ala Tyr Met Leu Glu
195 200 205

Arg Glu Leu Val Arg Lys Thr Arg Phe Leu Pro Val Ala Gly Gly Thr
210 215 220

Ser Ser Val Tyr Ile Glu Val Leu His Leu Thr Gln Gly Thr Cys Trp
225 230 235 240

Glu Gln Met Tyr Thr Pro Gly Gly Glu Val Arg Asn Asp Asp Ile Asp
245 250 255

Gln Ser Leu Ile Ile Ala Ala Arg Asn Ile Val Arg Arg Ala Thr Val
260 265 270

Ser Ala Asp Pro Leu Ala Ser Leu Leu Glu Met Cys His Ser Thr Gln
275 280 285

Ile Gly Gly Ile Arg Met Val Asp Ile Leu Lys Gln Asn Pro Thr Glu
290 295 300

Glu Gln Ala Val Asp Ile Cys Lys Ala Ala Met Gly Leu Arg Ile Ser
305 310 315 320

Ser Ser Phe Ser Phe Gly Gly Phe Thr Phe Lys Arg Thr Ser Gly Ser
325 330 335

EQ-1-C2-1.ST25.txt

Ser Val Lys Arg Glu Glu Glu Met Leu Thr Gly Asn Leu Gln Thr Leu
340 345 350

Lys Ile Arg Val His Glu Gly Tyr Glu Glu Phe Thr Met Val Gly Arg
355 360 365

Arg Ala Thr Ala Ile Leu Arg Lys Ala Thr Arg Arg Leu Ile Gln Leu
370 375 380

Ile Val Ser Gly Arg Asp Glu Gln Ser Ile Ala Glu Ala Ile Ile Val
385 390 395 400

Ala Met Val Phe

<210> 18
<211> 1214
<212> DNA
<213> Equine influenza virus H3N8

<400> 18
atggagagaa taaaagaact gagagatcta atgtcacaat cccgcacccg cgagatacta 60
acaaaaaacta ctgtggacca catggccata atcaagaaat acacatcagg aagacaagag 120
aagaaccccg cacttaggat gaagtggatg atggcaatga aatacccaat tacagcagat 180
aagaggataa tggaaatgat tcctgagaga aatgaacagg ggcaaaccct ttggagcaaa 240
acgaacgatg ctggctcaga ccgcgtaatg gtatcacctc tggcagtgac atggtgaaat 300
aggaatggac caacaacgag cacaattcat tatccaaaag tccacaaaac ttattttgaa 360
aaagttgaaa gattaaaaca cggaaccttt ggccccgttc attttaggaa tcaagtcaag 420
ataagacgga gagttgatgt aaaccctggt cacgcggacc tcagtgccaa agaagcacaa 480
gatgtgatca tggaagttgt tttcccaaat gaagtggag ccagaattct aacatcgaa 540
tcacaactaa caataaccaa agagaaaaaa gaagaacttc aggactgcaa aattgcccc 600
ttgatggtag catacatgct agaaagagag ttggccgaa aaacaagatt cctccagtg 660
gctggcggaa caagcagtgt atacattgaa gtgttgcatt tgactcaggg aacatgctgg 720
gaacaaatgt acacccagg aggagaagtt agaaacgatg acattgatca aagtttaatt 780
attgctgccc ggaacatagt gagaagagcg acagtatcag cagatccact agcatccctg 840
ctggaaatgt gccacagttac acagatttgtt ggaataagga tggtagacat ccttaaggc 900
aatccaacag aggaacaagc tgtggatata tgcaaagcag caatggggtt aagaattagc 960

EQ-1-C2-1.ST25.txt

| | | | | | | |
|------------|------------|------------|------------|-------------|------------|------|
| tcatcattca | gctttggtgg | attcacctt | aagagaacaa | gtggatcatc | agtcaagaga | 1020 |
| gaagaagaaa | tgcttacggg | caaccttcaa | acattgaaaa | taagagtgc | tgaaggctat | 1080 |
| gaagaattca | caatggtcgg | aagaagagca | acagccattc | tcagaaaaggc | aaccagaaga | 1140 |
| ttgattcaat | tgatagtaag | tggagagat | gaacaatcaa | ttgctgaagc | aataattgta | 1200 |
| gccatggtgt | tttc | | | | | 1214 |

<210> 19
<211> 1233
<212> DNA
<213> Equine influenza virus H3N8

<220>
<221> CDS
<222> (3)..(1196)
<223>

| | | | | | | |
|---|---------|-----|----|--|--|-----|
| <400> 19 | | | | | | |
| ta gaa ttc aca atg gtc gga aga aga gca aca gcc att ctc | aga aag | | | | | 47 |
| Glu Phe Thr Met Val Gly Arg Arg Ala Thr Ala Ile Leu Arg Lys | | | | | | |
| 1 | 5 | 10 | 15 | | | |
| gca acc aga aga ttg att caa ttg ata gta agt ggg aga gat gaa caa | | | | | | 95 |
| Ala Thr Arg Arg Leu Ile Gln Leu Ile Val Ser Gly Arg Asp Glu Gln | | | | | | |
| 20 | 25 | 30 | | | | |
| tca att gct gaa gca ata att gta gcc atg gtg ttt tcg caa gaa gat | | | | | | 143 |
| Ser Ile Ala Glu Ala Ile Ile Val Ala Met Val Phe Ser Gln Glu Asp | | | | | | |
| 35 | 40 | 45 | | | | |
| tgc atg ata aaa gca gtt cga ggc gat ttg aac ttc gtt aat aga gca | | | | | | 191 |
| Cys Met Ile Lys Ala Val Arg Gly Asp Leu Asn Phe Val Asn Arg Ala | | | | | | |
| 50 | 55 | 60 | | | | |
| aat cag cgc ttg aac ccc atg cat caa ctc ttg agg cat ttc caa aaa | | | | | | 239 |
| Asn Gln Arg Leu Asn Pro Met His Gln Leu Leu Arg His Phe Gln Lys | | | | | | |
| 65 | 70 | 75 | | | | |
| gat gca aaa gtg ctt ttc cag aat tgg ggg att gaa ccc atc gac aat | | | | | | 287 |
| Asp Ala Lys Val Leu Phe Gln Asn Trp Gly Ile Glu Pro Ile Asp Asn | | | | | | |
| 80 | 85 | 90 | 95 | | | |
| gtg atg gga atg att gga ata ttg cct gac atg acc cca agc acc gag | | | | | | 335 |
| Val Met Gly Met Ile Gly Ile Leu Pro Asp Met Thr Pro Ser Thr Glu | | | | | | |
| 100 | 105 | 110 | | | | |
| atg tca ttg aga gga gtg aga gtc agc aaa atg gga gtg gat gag tac | | | | | | 383 |
| Met Ser Leu Arg Gly Val Arg Val Ser Lys Met Gly Val Asp Glu Tyr | | | | | | |
| 115 | 120 | 125 | | | | |
| tcc agc act gag aga gtg gtg agc att gac cgt ttt tta aga gtt | | | | | | 431 |
| Ser Ser Thr Glu Arg Val Val Ser Ile Asp Arg Phe Leu Arg Val | | | | | | |
| 130 | 135 | 140 | | | | |

EQ-1-C2-1.ST25.txt

| | |
|---|------|
| cg gat caa agg gga aac ata cta ctg tcc cct gaa gag gtc agt gaa Arg Asp Gln Arg Gly Asn Ile Leu Leu Ser Pro Glu Glu Val Ser Glu 145 150 155 | 479 |
| aca caa gga acg gaa aag ctg aca ata att tat tca tca tca atg atg Thr Gln Gly Thr Glu Lys Leu Thr Ile Ile Tyr Ser Ser Ser Met Met 160 165 170 175 | 527 |
| tgg gag att aat ggt ccc gaa tca gtg ttg gtc aat act tat caa tgg Trp Glu Ile Asn Gly Pro Glu Ser Val Leu Val Asn Thr Tyr Gln Trp 180 185 190 | 575 |
| atc atc agg aac tgg gaa att gtg aaa att caa tgg tca cag gat ccc Ile Ile Arg Asn Trp Glu Ile Val Lys Ile Gln Trp Ser Gln Asp Pro 195 200 205 | 623 |
| aca atg tta tac aat aag ata gaa ttt gag cca ttc cag tcc ctg gtc Thr Met Leu Tyr Asn Lys Ile Glu Phe Glu Pro Phe Gln Ser Leu Val 210 215 220 | 671 |
| cct agg gcc acc aga agc caa tac agc ggt ttc gta aga acc ctg ttt Pro Arg Ala Thr Arg Ser Gln Tyr Ser Gly Phe Val Arg Thr Leu Phe 225 230 235 | 719 |
| cag caa atg cga gat gta ctt gga aca ttt gat act gct caa ata ata Gln Gln Met Arg Asp Val Leu Gly Thr Phe Asp Thr Ala Gln Ile Ile 240 245 250 255 | 767 |
| aaa ctc ctc cct ttt gcc gct gct cct ccg gaa cag agt agg atg cag Lys Leu Leu Pro Phe Ala Ala Pro Pro Glu Gln Ser Arg Met Gln 260 265 270 | 815 |
| ttc tct tct ttg act gtt aat gta aga gga tcg gga atg agg ata ctt Phe Ser Ser Leu Thr Val Asn Val Arg Gly Ser Gly Met Arg Ile Leu 275 280 285 | 863 |
| gta aga ggc aat tcc cca gtg ttc aac tac aat aaa gcc act aag agg Val Arg Gly Asn Ser Pro Val Phe Asn Tyr Asn Lys Ala Thr Lys Arg 290 295 300 | 911 |
| ctc aca gtc ctc gga aag gat gca ggt gcg ctt act gaa gac cca gat Leu Thr Val Leu Gly Lys Asp Ala Gly Ala Leu Thr Glu Asp Pro Asp 305 310 315 | 959 |
| gaa ggt acg gct gga gta gaa tct gct gtt cta aga ggg ttt ctc att Glu Gly Thr Ala Gly Val Glu Ser Ala Val Leu Arg Gly Phe Leu Ile 320 325 330 335 | 1007 |
| tta ggt aaa gaa aac aag aga tat ggc cca gca cta agc atc aat gaa Leu Gly Lys Glu Asn Lys Arg Tyr Gly Pro Ala Leu Ser Ile Asn Glu 340 345 350 | 1055 |
| ctg agc aaa ctt gca aaa ggg gag aaa gct aat gtg cta att ggg caa Leu Ser Lys Leu Ala Lys Gly Glu Lys Ala Asn Val Leu Ile Gly Gln 355 360 365 | 1103 |
| ggg gac gtg gtg ttg gta atg aaa cg gaa cgt gac tct agc ata ctt Gly Asp Val Val Leu Val Met Lys Arg Lys Arg Asp Ser Ser Ile Leu | 1151 |

EQ-1-C2-1.ST25.txt

370

375

380

act gac agc cag aca gcg acc aaa agg att cg^g atg gcc atc aat
 Thr Asp Ser Gln Thr Ala Thr Lys Arg Ile Arg Met Ala Ile Asn
 385 390 395

1196

tagtgaa ttgtttaaaa acgaccttgt ttctact

1233

<210> 20
 <211> 398
 <212> PRT
 <213> Equine influenza virus H3N8

<400> 20

Glu Phe Thr Met Val Gly Arg Arg Ala Thr Ala Ile Leu Arg Lys Ala
 1 5 10 15

Thr Arg Arg Leu Ile Gln Leu Ile Val Ser Gly Arg Asp Glu Gln Ser
 20 25 30

Ile Ala Glu Ala Ile Ile Val Ala Met Val Phe Ser Gln Glu Asp Cys
 35 40 45

Met Ile Lys Ala Val Arg Gly Asp Leu Asn Phe Val Asn Arg Ala Asn
 50 55 60

Gln Arg Leu Asn Pro Met His Gln Leu Leu Arg His Phe Gln Lys Asp
 65 70 75 80

Ala Lys Val Leu Phe Gln Asn Trp Gly Ile Glu Pro Ile Asp Asn Val
 85 90 95

Met Gly Met Ile Gly Ile Leu Pro Asp Met Thr Pro Ser Thr Glu Met
 100 105 110

Ser Leu Arg Gly Val Arg Val Ser Lys Met Gly Val Asp Glu Tyr Ser
 115 120 125

Ser Thr Glu Arg Val Val Ser Ile Asp Arg Phe Leu Arg Val Arg
 130 135 140

Asp Gln Arg Gly Asn Ile Leu Leu Ser Pro Glu Glu Val Ser Glu Thr
 145 150 155 160

Gln Gly Thr Glu Lys Leu Thr Ile Ile Tyr Ser Ser Ser Met Met Trp
 165 170 175

EQ-1-C2-1.ST25.txt

Glu Ile Asn Gly Pro Glu Ser Val Leu Val Asn Thr Tyr Gln Trp Ile
180 185 190

Ile Arg Asn Trp Glu Ile Val Lys Ile Gln Trp Ser Gln Asp Pro Thr
195 200 205

Met Leu Tyr Asn Lys Ile Glu Phe Glu Pro Phe Gln Ser Leu Val Pro
210 215 220

Arg Ala Thr Arg Ser Gln Tyr Ser Gly Phe Val Arg Thr Leu Phe Gln
225 230 235 240

Gln Met Arg Asp Val Leu Gly Thr Phe Asp Thr Ala Gln Ile Ile Lys
245 250 255

Leu Leu Pro Phe Ala Ala Ala Pro Pro Glu Gln Ser Arg Met Gln Phe
260 265 270

Ser Ser Leu Thr Val Asn Val Arg Gly Ser Gly Met Arg Ile Leu Val
275 280 285

Arg Gly Asn Ser Pro Val Phe Asn Tyr Asn Lys Ala Thr Lys Arg Leu
290 295 300

Thr Val Leu Gly Lys Asp Ala Gly Ala Leu Thr Glu Asp Pro Asp Glu
305 310 315 320

Gly Thr Ala Gly Val Glu Ser Ala Val Leu Arg Gly Phe Leu Ile Leu
325 330 335

Gly Lys Glu Asn Lys Arg Tyr Gly Pro Ala Leu Ser Ile Asn Glu Leu
340 345 350

Ser Lys Leu Ala Lys Gly Glu Lys Ala Asn Val Leu Ile Gly Gln Gly
355 360 365

Asp Val Val Leu Val Met Lys Arg Lys Arg Asp Ser Ser Ile Leu Thr
370 375 380

Asp Ser Gln Thr Ala Thr Lys Arg Ile Arg Met Ala Ile Asn
385 390 395

<210> 21
<211> 1194

EQ-1-C2-1.ST25.txt

<212> DNA

<213> Equine influenza virus H3N8

<400> 21

| | |
|---|------|
| gaattcacaa tggtcggaag aagagcaaca gccattctca gaaaggcaac cagaagattg | 60 |
| attcaattga tagtaagtgg gagagatgaa caatcaattt ctgaagcaat aattgttagcc | 120 |
| atggtgtttt cgcaagaaga ttgcatacgata aaagcagttc gaggcgattt gaacttcgtt | 180 |
| aatagagcaa atcagcgctt gaaccccattt catcaactct tgaggcattt ccaaaaagat | 240 |
| gcaaaaagtgc ttttccagaa ttgggggattt gaacccatcg acaatgttat gggatgattt | 300 |
| ggaatattgc ctgacatgac cccaaggcacc gagatgtcat tgagaggagt gagagtcagc | 360 |
| aaaatgggag tggatgagta ctccagcact gagagagtgg tggtgagcat tgaccgtttt | 420 |
| ttaagagttc gggatcaaag gggaaacata ctactgtccc ctgaagaggt cagtgaaaca | 480 |
| caaggaacgg aaaagctgac aataattttt tcatacatcaa tgatgtgggat gattaatggt | 540 |
| cccgaaatcag tggatgtcaa tacttatcaa tggatcatca ggaactgggat aattgtgaaa | 600 |
| attcaatggt cacaggatcc cacaatgtta tacaataaga tagaatttttga gccattccag | 660 |
| tccctggtcc cttagggccac cagaagccaa tacagcggtt tcgtaagaac cctgtttcag | 720 |
| caaatgcgag atgtacttgg aacatggat actgctcaaa taataaaaact cctccctttt | 780 |
| ggatcgggaa tgaggatact tgtaagagggc aattccccag tggtaacta caataaagcc | 840 |
| actaagagggc tcacagtcct cggaaaggat gcaggtgcgc ttactgaaga cccagatgaa | 900 |
| ggtagggctg gagtagaatac tgctgttcta agagggtttc tcatttttagg taaagaaaac | 960 |
| aagagatatg gcccagcact aagcatcaat gaactgagca aacttgcaaa aggggagaaaa | 1020 |
| gctaatgtgc taattgggca aggggacgtg gtgttgtaa tgaaacggaa acgtgactct | 1080 |
| agcatactta ctgacagcca gacagcgacc aaaaggattt ggatggccat caat | 1140 |
| | 1194 |

<210> 22

<211> 1232

<212> DNA

<213> Equine influenza virus H3N8

<400> 22

| | |
|---|-----|
| agaattcacaa atggtcggaag gaagagcaac agccattctc agaaaggcaac ccagaagatt | 60 |
| gattcaattt atagtaagtgg ggagagatga acaatcaattt gctgaagcaaa taattgttagc | 120 |
| catggtgtttt tcgcaagaag attgcatacgata aaagcagttt cgaggcgattt tgaacttcgtt | 180 |
| taatagagca aatcagcgctt tggtaacccat gcatcaactc ttgaggcattt tccaaaaaga | 240 |

EQ-1-C2-1.ST25.txt

| | | | | | | | |
|--------------|------------|-------------|------------|------------|------------|-------------|------|
| tgcaaaaagtgc | ctttccaga | attggggat | tgaaccatc | gacaatgtga | tggaatgtat | 300 | |
| tggaatattgc | cctgacatga | ccccaa | cgac | cgatgtca | ttgagaggag | 360 | |
| caaaatggat | gtggatgagt | actccagcac | tgagagat | gtggtagca | ttgaccgtt | 420 | |
| tttaagagtt | cgggatcaaa | ggggaa | acat | actactgtcc | cctgaagagg | 480 | |
| acaaggaacg | aaaaagctga | caataattt | ttcatcatca | atgatgtggg | agattaatgg | 540 | |
| tcccgaatca | gtgttggtca | atacttatca | atggatcatc | aggaactggg | aaatttgtaa | 600 | |
| aattcaatgg | tcacaggatc | ccacaatgtt | atacaataag | atagaatttg | agccattcca | 660 | |
| gtccctggtc | cctagggcc | ccagaagcc | atacagcggt | ttcgtaagaa | ccctgtttca | 720 | |
| gcaa | atgcga | gatgtacttgc | gaacatttga | tactgctcaa | ataataaaac | 780 | |
| tgccgctgct | cctccggAAC | agagtaggat | gcagttctct | tctttgactg | ttaatgtaa | 840 | |
| aggatcgggat | tgaggatac | ttgttaagagg | caattcccc | gtgttcaact | acaataaagc | 900 | |
| cactaagagg | ctcacagtcc | tcggaaagga | tgcaggtgcg | cttactgaag | acccagatga | 960 | |
| aggta | cggct | ggagtagaaat | ctgctgttct | aagagggttt | ctcattttag | gtaaagaaaa | 1020 |
| caagagat | ggcc | cagcac | taagcatcaa | tgaactgagc | aaacttgcaa | aaggggagaa | 1080 |
| agcta | atgt | ctaattggc | aaggggacgt | ggtgttggta | atgaaacgga | aacgtgactc | 1140 |
| tagcata | actt | actgacagcc | agacagcgac | caaaaggatt | cggatggcca | tcaatttagtg | 1200 |
| ttgaaattgtt | taaaaacgac | cttgtttcta | ct | | | 1232 | |

<210> 23
<211> 1232
<212> DNA
<213> Equine influenza virus H3N8

<220>
<221> CDS
<222> (2)..(1195)
<223>

| | | | | | | |
|---|----|----|----|----|--|-----|
| <400> 23 | | | | | | |
| a gaa ttc aca atg gtc gga aga aga gca aca gcc att ctc | 1 | 5 | 10 | 15 | | 49 |
| Glu Phe Thr Met Val Gly Arg Arg Ala Thr Ala Ile Leu Arg Lys Ala | | | | | | |
| acc aga aga ttg att caa ttg ata gta agt ggg aga gat gaa caa tca | 20 | 25 | 30 | | | 97 |
| Thr Arg Arg Leu Ile Gln Leu Ile Val Ser Gly Arg Asp Glu Gln Ser | | | | | | |
| att gct gaa gca ata att gta gcc atg gtg ttt tcg caa gaa gat tgc | 35 | 40 | 45 | | | 145 |
| Ile Ala Glu Ala Ile Ile Val Ala Met Val Phe Ser Gln Glu Asp Cys | | | | | | |

EQ-1-C2-1.ST25.txt

| | |
|---|-----|
| atg ata caa gca gtt cga ggc gat ttg aac ttc gtt aat aga gca aat Met Ile Gln Ala Val Arg Gly Asp Leu Asn Phe Val Asn Arg Ala Asn 50 55 60 | 193 |
| cag cgc ttg aac ccc atg cat caa ctc ttg agg cat ttc caa aaa gat Gln Arg Leu Asn Pro Met His Gln Leu Leu Arg His Phe Gln Lys Asp 65 70 75 80 | 241 |
| gca aaa gtg ctt ttc cag aat tgg ggg att gaa ccc atc gac aat gtg Ala Lys Val Leu Phe Gln Asn Trp Gly Ile Glu Pro Ile Asp Asn Val 85 90 95 | 289 |
| atg gga atg att gga ata ttg cct gac atg acc cca agc acc gag atg Met Gly Met Ile Gly Ile Leu Pro Asp Met Thr Pro Ser Thr Glu Met 100 105 110 | 337 |
| tca ttg aga gga gtg aga gtc agc aaa atg gga gtg gat gag tac tcc Ser Leu Arg Gly Val Arg Val Ser Lys Met Gly Val Asp Glu Tyr Ser 115 120 125 | 385 |
| agc act gag aga gtg gtg agc att gac cgt ttt tta aga gtt cgg Ser Thr Glu Arg Val Val Ser Ile Asp Arg Phe Leu Arg Val Arg 130 135 140 | 433 |
| gat caa agg gga aac ata cta ctg tcc cct gaa gag gtc agt gaa aca Asp Gln Arg Gly Asn Ile Leu Leu Ser Pro Glu Glu Val Ser Glu Thr 145 150 155 160 | 481 |
| caa gga acg gaa aag ctg aca ata att tat tca tca tca atg atg tgg Gln Gly Thr Glu Lys Leu Thr Ile Ile Tyr Ser Ser Met Met Trp 165 170 175 | 529 |
| gag att aat ggt ccc gaa tca gtg ttg gtc aat act tat caa tgg atc Glu Ile Asn Gly Pro Glu Ser Val Leu Val Asn Thr Tyr Gln Trp Ile 180 185 190 | 577 |
| atc agg aac tgg gaa att gtg aaa att caa tgg tca cag gat ccc aca Ile Arg Asn Trp Glu Ile Val Lys Ile Gln Trp Ser Gln Asp Pro Thr 195 200 205 | 625 |
| atg tta tac aat aag ata gaa ttt gag cca ttc cag tcc ctg gtc cct Met Leu Tyr Asn Lys Ile Glu Phe Glu Pro Phe Gln Ser Leu Val Pro 210 215 220 | 673 |
| agg gcc acc aga agc caa tac agc ggt ttc gta aga acc ctg ttt cag Arg Ala Thr Arg Ser Gln Tyr Ser Gly Phe Val Arg Thr Leu Phe Gln 225 230 235 240 | 721 |
| caa atg cga gat gta ctt gga aca ttt gat act gct caa ata ata aaa Gln Met Arg Asp Val Leu Gly Thr Phe Asp Thr Ala Gln Ile Ile Lys 245 250 255 | 769 |
| ctc ctc cct ttt gcc gct gct cct ccg gaa cag agt agg atg cag ttc Leu Leu Pro Phe Ala Ala Pro Pro Glu Gln Ser Arg Met Gln Phe 260 265 270 | 817 |
| tct tct ttg act gtt aat gta aga gga tcg gga atg agg ata ctt gta Ser Ser Leu Thr Val Asn Val Arg Gly Ser Gly Met Arg Ile Leu Val 275 280 285 | 865 |

EQ-1-C2-1.ST25.txt

| | |
|---|------|
| aga ggc aat tcc cca gtg ttc aac tac aat aaa gcc act aag agg ctc Arg Gly Asn Ser Pro Val Phe Asn Tyr Asn Lys Ala Thr Lys Arg Leu 290 295 300 | 913 |
| aca gtc ctc gga aaa gat gca ggt gcg ctt act gaa gac cca gat gaa Thr Val Leu Gly Lys Asp Ala Gly Ala Leu Thr Glu Asp Pro Asp Glu 305 310 315 320 | 961 |
| ggt acg gct gga gta gaa tct gct gtt cta aga ggg ttt ctc att tta Gly Thr Ala Gly Val Glu Ser Ala Val Leu Arg Gly Phe Leu Ile Leu 325 330 335 | 1009 |
| ggt aaa gaa aac aag aga tat ggc cca gca cta agc atc aat gaa ctg Gly Lys Glu Asn Lys Arg Tyr Gly Pro Ala Leu Ser Ile Asn Glu Leu 340 345 350 | 1057 |
| agc aaa ctt gca aaa ggg gag aaa gct aat gtg cta att ggg caa ggg Ser Lys Leu Ala Lys Gly Glu Lys Ala Asn Val Leu Ile Gly Gln Gly 355 360 365 | 1105 |
| gac gtg gtg ttg gta atg aaa cg ^g aaa cgt gac tct agc ata ctt act Asp Val Val Leu Val Met Lys Arg Lys Arg Asp Ser Ser Ile Leu Thr 370 375 380 | 1153 |
| gac agc cag aca gcg acc aaa agg att cg ^g atg gcc atc aat Asp Ser Gln Thr Ala Thr Lys Arg Ile Arg Met Ala Ile Asn 385 390 395 | 1195 |
| tagtgtt ^g aa ttgtttaaaa acgacc ^t tg ttctact | 1232 |

<210> 24
<211> 398
<212> PRT
<213> Equine influenza virus H3N8

<400> 24

Glu Phe Thr Met Val Gly Arg Arg Ala Thr Ala Ile Leu Arg Lys Ala
1 5 10 15

Thr Arg Arg Leu Ile Gln Leu Ile Val Ser Gly Arg Asp Glu Gln Ser
20 25 30

Ile Ala Glu Ala Ile Ile Val Ala Met Val Phe Ser Gln Glu Asp Cys
35 40 45

Met Ile Gln Ala Val Arg Gly Asp Leu Asn Phe Val Asn Arg Ala Asn
50 55 60

Gln Arg Leu Asn Pro Met His Gln Leu Leu Arg His Phe Gln Lys Asp
65 70 75 80

EQ-1-C2-1.ST25.txt

Ala Lys Val Leu Phe Gln Asn Trp Gly Ile Glu Pro Ile Asp Asn Val
85 90 95

Met Gly Met Ile Gly Ile Leu Pro Asp Met Thr Pro Ser Thr Glu Met
100 105 110

Ser Leu Arg Gly Val Arg Val Ser Lys Met Gly Val Asp Glu Tyr Ser
115 120 125

Ser Thr Glu Arg Val Val Val Ser Ile Asp Arg Phe Leu Arg Val Arg
130 135 140

Asp Gln Arg Gly Asn Ile Leu Leu Ser Pro Glu Glu Val Ser Glu Thr
145 150 155 160

Gln Gly Thr Glu Lys Leu Thr Ile Ile Tyr Ser Ser Ser Met Met Trp
165 170 175

Glu Ile Asn Gly Pro Glu Ser Val Leu Val Asn Thr Tyr Gln Trp Ile
180 185 190

Ile Arg Asn Trp Glu Ile Val Lys Ile Gln Trp Ser Gln Asp Pro Thr
195 200 205

Met Leu Tyr Asn Lys Ile Glu Phe Glu Pro Phe Gln Ser Leu Val Pro
210 215 220

Arg Ala Thr Arg Ser Gln Tyr Ser Gly Phe Val Arg Thr Leu Phe Gln
225 230 235 240

Gln Met Arg Asp Val Leu Gly Thr Phe Asp Thr Ala Gln Ile Ile Lys
245 250 255

Leu Leu Pro Phe Ala Ala Ala Pro Pro Glu Gln Ser Arg Met Gln Phe
260 265 270

Ser Ser Leu Thr Val Asn Val Arg Gly Ser Gly Met Arg Ile Leu Val
275 280 285

Arg Gly Asn Ser Pro Val Phe Asn Tyr Asn Lys Ala Thr Lys Arg Leu
290 295 300

Thr Val Leu Gly Lys Asp Ala Gly Ala Leu Thr Glu Asp Pro Asp Glu
305 310 315 320

EQ-1-C2-1.ST25.txt

Gly Thr Ala Gly Val Glu Ser Ala Val Leu Arg Gly Phe Leu Ile Leu
 325 330 335

Gly Lys Glu Asn Lys Arg Tyr Gly Pro Ala Leu Ser Ile Asn Glu Leu
 340 345 350

Ser Lys Leu Ala Lys Gly Glu Lys Ala Asn Val Leu Ile Gly Gln Gly
 355 360 365

Asp Val Val Leu Val Met Lys Arg Lys Arg Asp Ser Ser Ile Leu Thr
 370 375 380

Asp Ser Gln Thr Ala Thr Lys Arg Ile Arg Met Ala Ile Asn
 385 390 395

<210> 25
 <211> 1194
 <212> DNA
 <213> Equine influenza virus H3N8

| | | |
|---|-----|--|
| <400> 25 | | |
| gaattcacaa tggtcggaag aagagcaaca gccattctca gaaaggcaac cagaagattg | 60 | |
| atccaattga tagtaagtgg gagagatgaa caatcaattt ctgaagcaat aatttgttagcc | 120 | |
| atgggtttt cgcaagaaga ttgcataata caagcgttc gaggcgattt gaacttcgtt | 180 | |
| aatagagcaa atcagcgctt gaaccccatg catcaactct tgaggcattt caaaaaagat | 240 | |
| gcaaaaagtgc ttttccagaa ttgggggattt gaaccatcg acaatgtgat gggaaatgatt | 300 | |
| ggaatattgc ctgacatgac cccaaggcacc gagatgtcat tgagaggagt gagagtcagc | 360 | |
| aaaatgggag tggatgagta ctccagcact gagagagtgg tggtagcat tgaccgttt | 420 | |
| ttaagagttc gggatcaaag gggaaacata ctactgtccc ctgaagaggt cagtgaaaca | 480 | |
| caaggaacgg aaaagctgac aataatttat tcatacatcaa tgatgtgggaa gattaatgg | 540 | |
| cccaaatcag tggatgtcaa tacttatcaa tggatcatca ggaactgggaa aattgtgaaa | 600 | |
| attcaatggc cacaggatcc cacaatgtta tacaataaga tagaatttga gccattccag | 660 | |
| tccctggtcc cttagggccac cagaagccaa tacagcggtt tcgtaagaac cctgtttcag | 720 | |
| caaatgcgag atgtacttgg aacatttgat actgctaaa taataaaaact cctcccttt | 780 | |
| gccgctgctc ctccggaaaca gaggatggatc cagttctttt ctttgactgt taatgtaaa | 840 | |
| ggatcggaa tgaggatact tgtaagaggc aattccccag tggtaacta caataaagcc | 900 | |
| actaagaggc tcacagtcct cggaaaagat gcagggtgcgc ttactgaaga cccagatgaa | 960 | |

EQ-1-C2-1.ST25.txt

| | |
|---|------|
| ggtacggctg gagtagaaatc tgctgttcta agagggttgc tcatttttagg taaaagaaaaac | 1020 |
| aagagatatg gcccagcaact aagcatcaat gaactgagca aacttgcaaa aggggagaaaa | 1080 |
| gctaatgtgc taattggca aggggacgtg gtgttggtaa tgaaacggaa acgtgactct | 1140 |
| agcatactta ctgacagcca gacagcgacc aaaaggattc ggatggccat caat | 1194 |
| . | |
| <210> 26 | |
| <211> 23 | |
| <212> DNA | |
| <213> Artificial sequence | |
| . | |
| <220> | |
| <223> Synthetic Primer | |
| <400> 26 | |
| agcaaaagca ggttagatatt gaa | 23 |
| . | |
| <210> 27 | |
| <211> 24 | |
| <212> DNA | |
| <213> Artificial sequence | |
| . | |
| <220> | |
| <223> Synthetic Primer | |
| <400> 27 | |
| agttagaaaca aggtagttt ttac | 24 |
| . | |
| <210> 28 | |
| <211> 18 | |
| <212> DNA | |
| <213> Artificial sequence | |
| . | |
| <220> | |
| <223> Synthetic Primer | |
| <400> 28 | |
| cagggaaacag ctagtacc | 18 |
| . | |
| <210> 29 | |
| <211> 20 | |
| <212> DNA | |
| <213> Artificial sequence | |
| . | |
| <220> | |
| <223> Synthetic Primer | |
| <400> 29 | |
| taatacgact cactataggg | 20 |
| . | |
| <210> 30 | |
| <211> 18 | |

EQ-1-C2-1.ST25.txt

<212> DNA
<213> Artificial sequence

<220>
<223> Synthetic Primer

<400> 30
tggcacta gccagctg 18

<210> 31
<211> 18
<212> DNA
<213> Artificial sequence

<220>
<223> Synthetic Primer

<400> 31
ttgcctgtac catctgcc 18

<210> 32
<211> 23
<212> DNA
<213> Artificial sequence

<220>
<223> Synthetic Primer

<400> 32
agcaaaagca ggggatattt ctg 23

<210> 33
<211> 23
<212> DNA
<213> Artificial sequence

<220>
<223> Synthetic Primer

<400> 33
agttagaaaca agggtgtttt taa 23

<210> 34
<211> 16
<212> DNA
<213> Artificial sequence

<220>
<223> Synthetic Primer

<400> 34
gacatccctg actatg 16

<210> 35

EQ-1-C2-1.ST25.txt

<211> 16
<212> DNA
<213> Artificial sequence

<220>
<223> Synthetic Primer

<400> 35
gcatctgtta agtcaa

16

<210> 36
<211> 25
<212> DNA
<213> Artificial sequence

<220>
<223> Synthetic Primer

<400> 36
agcaaaagca ggtcaaatat attca

25

<210> 37
<211> 26
<212> DNA
<213> Artificial sequence

<220>
<223> Synthetic Primer

<400> 37
gaaaacaccca tggctacaat tattgc

26

<210> 38
<211> 27
<212> DNA
<213> Artificial sequence

<220>
<223> Synthetic Primer

<400> 38
agaattcaca atggtcggaa gaagagc

27

<210> 39
<211> 27
<212> DNA
<213> Artificial sequence

<220>
<223> Synthetic Primer

<400> 39
agtagaaaaca aggtcgaaaa taaaacaa

27

EQ-1-C2-1.ST25.txt

<210> 40
<211> 19
<212> DNA
<213> Artificial sequence

<220>
<223> Synthetic Primer

<400> 40
agccgtacct tcatctggg

19

<210> 41
<211> 19
<212> DNA
<213> Artificial sequence

<220>
<223> Synthetic Primer

<400> 41
agcactgaga gagtggtgg

19

<210> 42
<211> 19
<212> DNA
<213> Artificial sequence

<220>
<223> Synthetic Primer

<400> 42
gtaagaggca attccccag

19

<210> 43
<211> 18
<212> DNA
<213> Artificial sequence

<220>
<223> Synthetic Primer

<400> 43
cagttttcc gttccttg

18

<210> 44
<211> 2341
<212> DNA
<213> Equine influenza virus H3N8

<220>
<221> CDS
<222> (28)..(2304)
<223>

EQ-1-C2-1.ST25.txt

| | | | | |
|---|---|-----|-----|--|
| <400> 44 | | | | |
| agcaaaagca ggtcaaatat attcaat atg gag aga ata aaa gaa ctg aga gat | Met Glu Arg Ile Lys Glu Leu Arg Asp | 54 | | |
| 1 | 5 | | | |
| cta atg tca caa tcc cgc acc cgc gag ata cta aca aaa act act gtg | Leu Met Ser Gln Ser Arg Thr Arg Glu Ile Leu Thr Lys Thr Thr Val | 102 | | |
| 10 | 15 | 20 | 25 | |
| gac cac atg gcc ata atc aag aaa tac aca tca gga aga caa gag aag | Asp His Met Ala Ile Ile Lys Lys Tyr Thr Ser Gly Arg Gln Glu Lys | 150 | | |
| 30 | 35 | 40 | | |
| aac ccc gca ctt agg atg aag tgg atg atg gca atg aaa tac cca att | Asn Pro Ala Leu Arg Met Lys Trp Met Met Ala Met Lys Tyr Pro Ile | 198 | | |
| 45 | 50 | 55 | | |
| aca gca gat aag agg ata atg gaa atg att cct gag aga aat gaa cag | Thr Ala Asp Lys Arg Ile Met Glu Met Ile Pro Glu Arg Asn Glu Gln | 246 | | |
| 60 | 65 | 70 | | |
| ggg caa acc ctt tgg agc aaa acg aac gat gct ggc tca gac cgc gta | Gly Gln Thr Leu Trp Ser Lys Thr Asn Asp Ala Gly Ser Asp Arg Val | 294 | | |
| 75 | 80 | 85 | | |
| atg gta tca cct ctg gca gtg aca tgg tgg aat agg aat gga cca aca | Met Val Ser Pro Leu Ala Val Thr Trp Trp Asn Arg Asn Gly Pro Thr | 342 | | |
| 90 | 95 | 100 | 105 | |
| acg agc aca att cat tat cca aaa gtc tac aaa act tat ttt gaa aaa | Thr Ser Thr Ile His Tyr Pro Lys Val Tyr Lys Thr Tyr Phe Glu Lys | 390 | | |
| 110 | 115 | 120 | | |
| gtt gaa aga tta aaa cac gga acc ttt ggc ccc gtt cat ttt agg aat | Val Glu Arg Leu Lys His Gly Thr Phe Gly Pro Val His Phe Arg Asn | 438 | | |
| 125 | 130 | 135 | | |
| caa gtc aag ata aga cgg aga gtt gat gta aac cct ggt cac gcg gac | Gln Val Lys Ile Arg Arg Val Asp Val Asn Pro Gly His Ala Asp | 486 | | |
| 140 | 145 | 150 | | |
| ctc agt gcc aaa gaa gca caa gat gtg atc atg gaa gtt gtt ttc cca | Leu Ser Ala Lys Glu Ala Gln Asp Val Ile Met Glu Val Val Phe Pro | 534 | | |
| 155 | 160 | 165 | | |
| aat gaa gtg gga gcc aga att cta aca tcg gaa tca caa cta aca ata | Asn Glu Val Gly Ala Arg Ile Leu Thr Ser Glu Ser Gln Leu Thr Ile | 582 | | |
| 170 | 175 | 180 | 185 | |
| acc aaa gag aaa gaa gaa ctt cag gac tgc aaa att gcc ccc ttg | Thr Lys Glu Lys Glu Glu Leu Gln Asp Cys Lys Ile Ala Pro Leu | 630 | | |
| 190 | 195 | 200 | | |
| atg gta gca tac atg cta gaa aga gag ttg gtc cga aaa aca aga ttc | Met Val Ala Tyr Met Leu Glu Arg Glu Leu Val Arg Lys Thr Arg Phe | 678 | | |
| 205 | 210 | 215 | | |
| ctc cca gtg gct ggc gga aca agc agt gta tac att gaa gtg ttg cat | Leu Pro Val Ala Gly Gly Thr Ser Ser Val Tyr Ile Glu Val Leu His | 726 | | |

EQ-1-C2-1.ST25.txt

| 220 | 225 | 230 | |
|---|-----|-----|------|
| ctg act cag gga aca tgc tgg gaa caa atg tac acc cca gga gga gaa Leu Thr Gln Gly Thr Cys Trp Glu Gln Met Tyr Thr Pro Gly Gly Glu 235 240 245 | | | 774 |
| gtt aga aac gat gac att gat caa agt tta att att gct gcc cg ^g aac Val Arg Asn Asp Asp Ile Asp Gln Ser Leu Ile Ile Ala Ala Arg Asn 250 255 260 265 | | | 822 |
| ata gtg aga aga gc ^g aca gta tca gca gat cca cta gca tcc ctg ctg Ile Val Arg Arg Ala Thr Val Ser Ala Asp Pro Leu Ala Ser Leu Leu 270 275 280 | | | 870 |
| gaa atg tgc cac agt aca cag att ggt gga ata agg atg gta gac atc Glu Met Cys His Ser Thr Gln Ile Gly Gly Ile Arg Met Val Asp Ile 285 290 295 | | | 918 |
| ctt aag cag aat cca aca gag gaa caa gct gtg gat ata tgc aaa gca Leu Lys Gln Asn Pro Thr Glu Glu Gln Ala Val Asp Ile Cys Lys Ala 300 305 310 | | | 966 |
| gca atg ggg tta aga att agc tca tca ttc agc ttt ggt gga ttc acc Ala Met Gly Leu Arg Ile Ser Ser Phe Ser Phe Gly Gly Phe Thr 315 320 325 | | | 1014 |
| ttt aag aga aca agt gga tca tca gtc aag aga gaa gaa atg ctt Phe Lys Arg Thr Ser Gly Ser Ser Val Lys Arg Glu Glu Met Leu 330 335 340 345 | | | 1062 |
| acg ggc aac ctt caa aca ttg aaa ata aga gtg cat gaa ggc tat gaa Thr Gly Asn Leu Gln Thr Leu Lys Ile Arg Val His Glu Gly Tyr Glu 350 355 360 | | | 1110 |
| gaa ttc aca atg gtc gga aga aga gca aca gcc att ctc aga aag gca Glu Phe Thr Met Val Gly Arg Arg Ala Thr Ala Ile Leu Arg Lys Ala 365 370 375 | | | 1158 |
| acc aga aga ttg att caa ttg ata gta agt ggg aga gat gaa caa tca Thr Arg Arg Leu Ile Gln Leu Ile Val Ser Gly Arg Asp Glu Gln Ser 380 385 390 | | | 1206 |
| att gct gaa gca ata att gta gcc atg gtg ttt tcg caa gaa gat tgc Ile Ala Glu Ala Ile Val Ala Met Val Phe Ser Gln Glu Asp Cys 395 400 405 | | | 1254 |
| atg ata aaa gca gtt cga ggc gat ttg aac ttc gtt aat aga gca aat Met Ile Lys Ala Val Arg Gly Asp Leu Asn Phe Val Asn Arg Ala Asn 410 415 420 425 | | | 1302 |
| cag cgc ttg aac ccc atg cat caa ctc ttg agg cat ttc caa aaa gat Gln Arg Leu Asn Pro Met His Gln Leu Leu Arg His Phe Gln Lys Asp 430 435 440 | | | 1350 |
| gca aaa gtg ctt ttc cag aat tgg ggg att gaa ccc atc gac aat gtg Ala Lys Val Leu Phe Gln Asn Trp Gly Ile Glu Pro Ile Asp Asn Val 445 450 455 | | | 1398 |
| atg gga atg att gga ata ttg cct gac atg acc cca agc acc gag atg | | | 1446 |

EQ-1-C2-1.ST25.txt

| | | | |
|--|-----|-----|------|
| Met Gly Met Ile Gly Ile Leu Pro Asp Met Thr Pro Ser Thr Glu Met | | | |
| 460 | 465 | 470 | |
| tca ttg aga gga gtg aga gtc agc aaa atg gga gtg gat gag tac tcc | | | 1494 |
| Ser Leu Arg Gly Val Arg Val Ser Lys Met Gly Val Asp Glu Tyr Ser | | | |
| 475 | 480 | 485 | |
| agc act gag aga gtg gtg agc att gac cgt ttt tta aga gtt cg | | | 1542 |
| Ser Thr Glu Arg Val Val Ser Ile Asp Arg Phe Leu Arg Val Arg | | | |
| 490 | 495 | 500 | 505 |
| gat caa agg gga aac ata cta ctg tcc cct gaa gag gtc agt gaa aca | | | 1590 |
| Asp Gln Arg Gly Asn Ile Leu Leu Ser Pro Glu Glu Val Ser Glu Thr | | | |
| 510 | 515 | 520 | |
| caa gga acg gaa aag ctg aca ata att tat tca tca tca atg atg tgg | | | 1638 |
| Gln Gly Thr Glu Lys Leu Thr Ile Ile Tyr Ser Ser Ser Met Met Trp | | | |
| 525 | 530 | 535 | |
| gag att aat ggt ccc gaa tca gtg ttg gtc aat act tat caa tgg atc | | | 1686 |
| Glu Ile Asn Gly Pro Glu Ser Val Leu Val Asn Thr Tyr Gln Trp Ile | | | |
| 540 | 545 | 550 | |
| atc agg aac tgg gaa att gtg aaa att caa tgg tca cag gat ccc aca | | | 1734 |
| Ile Arg Asn Trp Glu Ile Val Lys Ile Gln Trp Ser Gln Asp Pro Thr | | | |
| 555 | 560 | 565 | |
| atg tta tac aat aag ata gaa ttt gag cca ttc cag tcc ctg gtc cct | | | 1782 |
| Met Leu Tyr Asn Lys Ile Glu Phe Glu Pro Phe Gln Ser Leu Val Pro | | | |
| 570 | 575 | 580 | 585 |
| agg gcc acc aga agc caa tac agc ggt ttc gta aga acc ctg ttt cag | | | 1830 |
| Arg Ala Thr Arg Ser Gln Tyr Ser Gly Phe Val Arg Thr Leu Phe Gln | | | |
| 590 | 595 | 600 | |
| caa atg cga gat gta ctt gga aca ttt gat act gct caa ata ata aaa- | | | 1878 |
| Gln Met Arg Asp Val Leu Gly Thr Phe Asp Thr Ala Gln Ile Ile Lys | | | |
| 605 | 610 | 615 | |
| ctc ctc cct ttt gcc gct cct ccg gaa cag agt agg atg cag ttc | | | 1926 |
| Leu Leu Pro Phe Ala Ala Pro Pro Glu Gln Ser Arg Met Gln Phe | | | |
| 620 | 625 | 630 | |
| tct tct ttg act gtt aat gta aga gga tcg gga atg agg ata ctt gta | | | 1974 |
| Ser Ser Leu Thr Val Asn Val Arg Gly Ser Gly Met Arg Ile Leu Val | | | |
| 635 | 640 | 645 | |
| aga ggc aat tcc cca gtg ttc aac tac aat aaa gcc act aag agg ctc | | | 2022 |
| Arg Gly Asn Ser Pro Val Phe Asn Tyr Asn Lys Ala Thr Lys Arg Leu | | | |
| 650 | 655 | 660 | 665 |
| aca gtc ctc gga aag gat gca ggt gcg ctt act gaa gac cca gat gaa | | | 2070 |
| Thr Val Leu Gly Lys Asp Ala Gly Ala Leu Thr Glu Asp Pro Asp Glu | | | |
| 670 | 675 | 680 | |
| ggt acg gct gga gta gaa tct gct gtt cta aga ggg ttt ctc att tta | | | 2118 |
| Gly Thr Ala Gly Val Glu Ser Ala Val Leu Arg Gly Phe Leu Ile Leu | | | |
| 685 | 690 | 695 | |

EQ-1-C2-1.ST25.txt

| | |
|---|------|
| ggt aaa gaa aac aag aga tat ggc cca gca cta agc atc aat gaa ctg Gly Lys Glu Asn Lys Arg Tyr Gly Pro Ala Leu Ser Ile Asn Glu Leu 700 705 710 | 2166 |
| agc aaa ctt gca aaa ggg gag aaa gct aat gtg cta att ggg caa ggg Ser Lys Leu Ala Lys Gly Glu Lys Ala Asn Val Leu Ile Gly Gln Gly 715 720 725 | 2214 |
| gac gtg gtg ttg gta atg aaa cgg aaa cgt gac tct agc ata ctt act Asp Val Val Leu Val Met Lys Arg Lys Arg Asp Ser Ser Ile Leu Thr 730 735 740 745 | 2262 |
| gac agc cag aca gcg acc aaa agg att cgg atg gcc atc aat Asp Ser Gln Thr Ala Thr Lys Arg Ile Arg Met Ala Ile Asn 750 755 | 2304 |
| tagtgttcaa ttgtttaaaa acgacccgtt ttctact | 2341 |

<210> 45
<211> 759
<212> PRT
<213> Equine influenza virus H3N8

<400> 45

| |
|--|
| Met Glu Arg Ile Lys Glu Leu Arg Asp Leu Met Ser Gln Ser Arg Thr 1 5 10 15 |
|--|

| |
|---|
| Arg Glu Ile Leu Thr Lys Thr Val Asp His Met Ala Ile Ile Lys 20 25 30 |
|---|

| |
|---|
| Lys Tyr Thr Ser Gly Arg Gln Glu Lys Asn Pro Ala Leu Arg Met Lys 35 40 45 |
|---|

| |
|---|
| Trp Met Met Ala Met Lys Tyr Pro Ile Thr Ala Asp Lys Arg Ile Met 50 55 60 |
|---|

| |
|--|
| Glu Met Ile Pro Glu Arg Asn Glu Gln Gly Gln Thr Leu Trp Ser Lys 65 70 75 80 |
|--|

| |
|---|
| Thr Asn Asp Ala Gly Ser Asp Arg Val Met Val Ser Pro Leu Ala Val 85 90 95 |
|---|

| |
|--|
| Thr Trp Trp Asn Arg Asn Gly Pro Thr Thr Ser Thr Ile His Tyr Pro 100 105 110 |
|--|

| |
|--|
| Lys Val Tyr Lys Thr Tyr Phe Glu Lys Val Glu Arg Leu Lys His Gly 115 120 125 |
|--|

Thr Phe Gly Pro Val His Phe Arg Asn Gln Val Lys Ile Arg Arg Arg

EQ-1-C2-1.ST25.txt

130

135

140

Val Asp Val Asn Pro Gly His Ala Asp Leu Ser Ala Lys Glu Ala Gln
145 150 155 160

Asp Val Ile Met Glu Val Val Phe Pro Asn Glu Val Gly Ala Arg Ile
165 170 175

Leu Thr Ser Glu Ser Gln Leu Thr Ile Thr Lys Glu Lys Lys Glu Glu
180 185 190

Leu Gln Asp Cys Lys Ile Ala Pro Leu Met Val Ala Tyr Met Leu Glu
195 200 205

Arg Glu Leu Val Arg Lys Thr Arg Phe Leu Pro Val Ala Gly Gly Thr
210 215 220

Ser Ser Val Tyr Ile Glu Val Leu His Leu Thr Gln Gly Thr Cys Trp
225 230 235 240

Glu Gln Met Tyr Thr Pro Gly Gly Glu Val Arg Asn Asp Asp Ile Asp
245 250 255

Gln Ser Leu Ile Ile Ala Ala Arg Asn Ile Val Arg Arg Ala Thr Val
260 265 270

Ser Ala Asp Pro Leu Ala Ser Leu Leu Glu Met Cys His Ser Thr Gln
275 280 285

Ile Gly Gly Ile Arg Met Val Asp Ile Leu Lys Gln Asn Pro Thr Glu
290 295 300

Glu Gln Ala Val Asp Ile Cys Lys Ala Ala Met Gly Leu Arg Ile Ser
305 310 315 320

Ser Ser Phe Ser Phe Gly Gly Phe Thr Phe Lys Arg Thr Ser Gly Ser
325 330 335

Ser Val Lys Arg Glu Glu Met Leu Thr Gly Asn Leu Gln Thr Leu
340 345 350

Lys Ile Arg Val His Glu Gly Tyr Glu Glu Phe Thr Met Val Gly Arg
355 360 365

EQ-1-C2-1.ST25.txt

Arg Ala Thr Ala Ile Leu Arg Lys Ala Thr Arg Arg Leu Ile Gln Leu
370 375 380

Ile Val Ser Gly Arg Asp Glu Gln Ser Ile Ala Glu Ala Ile Ile Val
385 390 395 400

Ala Met Val Phe Ser Gln Glu Asp Cys Met Ile Lys Ala Val Arg Gly
405 410 415

Asp Leu Asn Phe Val Asn Arg Ala Asn Gln Arg Leu Asn Pro Met His
420 425 430

Gln Leu Leu Arg His Phe Gln Lys Asp Ala Lys Val Leu Phe Gln Asn
435 440 445

Trp Gly Ile Glu Pro Ile Asp Asn Val Met Gly Met Ile Gly Ile Leu
450 455 460

Pro Asp Met Thr Pro Ser Thr Glu Met Ser Leu Arg Gly Val Arg Val
465 470 475 480

Ser Lys Met Gly Val Asp Glu Tyr Ser Ser Thr Glu Arg Val Val Val
485 490 495

Ser Ile Asp Arg Phe Leu Arg Val Arg Asp Gln Arg Gly Asn Ile Leu
500 505 510

Leu Ser Pro Glu Glu Val Ser Glu Thr Gln Gly Thr Glu Lys Leu Thr
515 520 525

Ile Ile Tyr Ser Ser Met Met Trp Glu Ile Asn Gly Pro Glu Ser
530 535 540

Val Leu Val Asn Thr Tyr Gln Trp Ile Ile Arg Asn Trp Glu Ile Val
545 550 555 560

Lys Ile Gln Trp Ser Gln Asp Pro Thr Met Leu Tyr Asn Lys Ile Glu
565 570 575

Phe Glu Pro Phe Gln Ser Leu Val Pro Arg Ala Thr Arg Ser Gln Tyr
580 585 590

Ser Gly Phe Val Arg Thr Leu Phe Gln Gln Met Arg Asp Val Leu Gly
595 600 605

EQ-1-C2-1.ST25.txt

Thr Phe Asp Thr Ala Gln Ile Ile Lys Leu Leu Pro Phe Ala Ala Ala
610 615 620

Pro Pro Glu Gln Ser Arg Met Gln Phe Ser Ser Leu Thr Val Asn Val
625 630 635 640

Arg Gly Ser Gly Met Arg Ile Leu Val Arg Gly Asn Ser Pro Val Phe
645 650 655

Asn Tyr Asn Lys Ala Thr Lys Arg Leu Thr Val Leu Gly Lys Asp Ala
660 665 670

Gly Ala Leu Thr Glu Asp Pro Asp Glu Gly Thr Ala Gly Val Glu Ser
675 680 685

Ala Val Leu Arg Gly Phe Leu Ile Leu Gly Lys Glu Asn Lys Arg Tyr
690 695 700

Gly Pro Ala Leu Ser Ile Asn Glu Leu Ser Lys Leu Ala Lys Gly Glu
705 710 715 720

Lys Ala Asn Val Leu Ile Gly Gln Gly Asp Val Val Leu Val Met Lys
725 730 735

Arg Lys Arg Asp Ser Ser Ile Leu Thr Asp Ser Gln Thr Ala Thr Lys
740 745 750

Arg Ile Arg Met Ala Ile Asn
755

<210> 46
<211> 2277
<212> DNA
<213> Equine influenza virus H3N8

<400> 46
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acaaaaaacta ctgtggacca catggccata atcaagaaaat acacatcagg aagacaagag 120
aagaaccccg cacttaggat gaagtggatg atggcaatga aatacccaat tacagcagat 180
aaggaggataa tggaaatgat tcctgagaga aatgaacagg ggcaaaccct ttggagcaaa 240
acgaacgatg ctggctcaga ccgcgtaatg gtatcacctc tggcagtgac atggtgaaat 300
aggaatggac caacaacgag cacaattcat tatccaaaag tctacaaaac ttatggaa 360

EQ-1-C2-1.ST25.txt

| | |
|---|------|
| aaagttgaaa gattaaaaca cggaacctt ggccccgttc attttaggaa tcaagtcaag | 420 |
| ataagacgga gagttgatgt aaaccctggc cacgcggacc tcagtgc当地 agaagcacaa | 480 |
| gatgtgatca tggaaaggtagt tttcccaaata gaagtgggag ccagaattct aacatcgaa | 540 |
| tcacaactaa caataaccaa agagaaaaaa gaagaacttc aggactgcaa aattgcccc | 600 |
| ttgatggtag catacatgct agaaagagag ttggtccgaa aaacaagatt cctcccagt | 660 |
| gctggcggaa caagcagtgt atacattgaa gtgtgc当地 tgactcaggg aacatgctgg | 720 |
| gaacaaatgt acaccccagg aggagaagtt agaaacgatg acattgatca aagtttaatt | 780 |
| attgctgccc ggaacatagt gagaagagcg acagtatcg cagatccact agcatccctg | 840 |
| ctggaaatgt gccacagtac acagattggt ggaataagga tggtagacat ccttaagcag | 900 |
| aatccaacag aggaacaacg tgtggatata tgcaaagcag caatggggtt aagaattagc | 960 |
| tcatcattca gctttggtgg attcacctt aagagaacaa gtggatcatc agtcaagaga | 1020 |
| gaagaagaaa tgcttacggg caaccccaa acattgaaaa taagagtca tgaaggctat | 1080 |
| gaagaattca caatggtcgg aagaagagca acagccattc tcagaaaggc aaccagaaga | 1140 |
| ttgattcaat tgatagtaag tggagagat gaacaatcaa ttgctgaagc aataattgt | 1200 |
| gccatggtgt tttcgcaaga agattgcatg ataaaagcag ttgcaggcga tttgaacttc | 1260 |
| gttaatagag caaatcagcg cttgaacccc atgcatcaac tcttgaggca tttccaaaaa | 1320 |
| gatgcaaaag tgctttcca gaattggggg attgaaccca tcgacaatgt gatggaaatg | 1380 |
| attggaatat tgcctgacat gaccccaagc accgagatgt cattgagagg agttagatgc | 1440 |
| agcaaaatgg gagtggatga gtactccagc actgagagag tggtagttag cattgaccgt | 1500 |
| tttttaagag ttccggatca aaggggaaac atactactgt cccctgaaga ggtcagtgaa | 1560 |
| acacaaggaa cggaaaagct gacaataatt tattcatcat caatgatgtg ggagattaat | 1620 |
| ggccccgaat cagtgttggc caatacttat caatggatca tcaggaactg ggaaattgt | 1680 |
| aaaattcaat ggtcacagga tcccacaatg ttatacaata agatagaatt tgagccattc | 1740 |
| cagtccctgg tcccttagggc caccagaagc caatacagcg gtttcgtaaag aaccctgttt | 1800 |
| cagcaaatgc gagatgtact tggAACATTG gatactgctc aaataataaa actcctccct | 1860 |
| tttgcgcgtg ctccctccggc acagagtagg atgcagttct cttcttgac tgttaatgt | 1920 |
| agaggatcgg gaatgaggat acttgtttaga ggcaattccc cagtgttcaa ctacaataaa | 1980 |
| gccactaaga ggctcacagt cctcgaaag gatgcagggt cgcttactga agaccagat | 2040 |
| gaaggtacgg ctggagttaga atctgctgtt ctaagagggt ttctcatttt agttaagaa | 2100 |
| aacaagagat atggcccagc actaagcatc aatgaactga gcaaacttgc aaaaggggag | 2160 |

EQ-1-C2-1.ST25.txt

aaagctaattg tgcttaattgg gcaaggggac gtgggtttgg taatgaaacg gaaacgtgac 2220
tctagcatac ttactgacag ccagacagcg accaaaagga ttcggatggc catcaat 2277

<210> 47
<211> 2341
<212> DNA
<213> Equine influenza virus H3N8

<220>
<221> CDS
<222> (28)..(2304)
<223>

<400> 47
agcaaaaagca ggtcaaatat attcaat atg gag aga ata aaa gaa ctg aga gat 54
Met Glu Arg Ile Lys Glu Leu Arg Asp
1 5

cta atg tca caa tcc cgc acc cgc gag ata cta aca aaa act act gtg 102
Leu Met Ser Gln Ser Arg Thr Arg Glu Ile Leu Thr Lys Thr Val
10 15 20 25

gac cac atg gcc ata atc aag aaa tac aca tca gga aga caa gag aag 150
Asp His Met Ala Ile Ile Lys Lys Tyr Thr Ser Gly Arg Gln Glu Lys
30 35 40

aac ccc gca ctt agg atg aag tgg atg atg gca atg aaa tac cca att 198
Asn. Pro Ala Leu Arg Met Lys Trp Met Met Ala Met Lys Tyr Pro Ile
45 50 55

aca gca gat aag agg ata atg gaa atg att cct gag aga aat gaa cag 246
Thr Ala Asp Lys Arg Ile Met Glu Met Ile Pro Glu Arg Asn Glu Gln
60 65 70

ggg caa acc ctt tgg agc aaa acg aac gat gct ggc tca gac cgc gta 294
Gly Gln Thr Leu Trp Ser Lys Thr Asn Asp Ala Gly Ser Asp Arg Val
75 80 85

atg gta tca cct ctg gca gtg aca tgg tgg aat agg aat gga cca aca 342
Met Val Ser Pro Leu Ala Val Thr Trp Trp Asn Arg Asn Gly Pro Thr
90 95 100 105

acg agc aca att cat tat cca aaa gtc cac aaa act tat ttt gaa aaa 390
Thr Ser Thr Ile His Tyr Pro Lys Val His Lys Thr Tyr Phe Glu Lys
110 115 120

gtt gaa aga tta aaa cac gga acc ttt ggc ccc gtt cat ttt agg aat 438
Val Glu Arg Leu Lys His Gly Thr Phe Gly Pro Val His Phe Arg Asn
125 130 135

caa gtc aag ata aga cgg aga gtt gat gta aac cct ggt cac gcg gac 486
Gln Val Lys Ile Arg Arg Val Asp Val Asn Pro Gly His Ala Asp
140 145 150

ctc agt gcc aaa gaa gca caa gat gtg atc atg gaa gtt gtt ttc cca 534

EQ-1-C2-1.ST25.txt

| | | | |
|---|-----|-----|------|
| Leu Ser Ala Lys Glu Ala Gln Asp Val Ile Met Glu Val Val Phe Pro | | | |
| 155 | 160 | 165 | |
| aat gaa gtg gga gcc aga att cta aca tcg gaa tca caa cta aca ata | | | 582 |
| Asn Glu Val Gly Ala Arg Ile Leu Thr Ser Glu Ser Gln Leu Thr Ile | | | |
| 170 | 175 | 180 | 185 |
| acc aaa gag aaa aaa gaa gaa ctt cag gac tgc aaa att gcc ccc ttg | | | 630 |
| Thr Lys Glu Lys Lys Glu Glu Leu Gln Asp Cys Lys Ile Ala Pro Leu | | | |
| 190 | 195 | 200 | |
| atg gta gca tac atg cta gaa aga gag ttg gtc cga aaa aca aga ttc | | | 678 |
| Met Val Ala Tyr Met Leu Glu Arg Glu Leu Val Arg Lys Thr Arg Phe | | | |
| 205 | 210 | 215 | |
| ctc cca gtg gct ggc gga aca agc agt gta tac att gaa gtg ttg cat | | | 726 |
| Leu Pro Val Ala Gly Gly Thr Ser Ser Val Tyr Ile Glu Val Leu His | | | |
| 220 | 225 | 230 | |
| ctg act cag gga aca tgc tgg gaa caa atg tac acc cca gga gga gaa | | | 774 |
| Leu Thr Gln Gly Thr Cys Trp Glu Gln Met Tyr Thr Pro Gly Gly Glu | | | |
| 235 | 240 | 245 | |
| gtt aga aac gat gac att gat caa agt tta att att gct gcc cgg aac | | | 822 |
| Val Arg Asn Asp Asp Ile Asp Gln Ser Leu Ile Ile Ala Ala Arg Asn | | | |
| 250 | 255 | 260 | 265 |
| ata gtg aga aga gcg aca gta tca gca gat cca cta gca tcc ctg ctg | | | 870 |
| Ile Val Arg Arg Ala Thr Val Ser Ala Asp Pro Leu Ala Ser Leu Leu | | | |
| 270 | 275 | 280 | |
| gaa atg tgc cac agt aca cag att ggt gga ata agg atg gta gac atc | | | 918 |
| Glu Met Cys His Ser Thr Gln Ile Gly Gly Ile Arg Met Val Asp Ile | | | |
| 285 | 290 | 295 | |
| ctt aag cag aat cca aca gag gaa caa gct gtg gat ata tgc aaa gca | | | 966 |
| Leu Lys Gln Asn Pro Thr Glu Gln Ala Val Asp Ile Cys Lys Ala | | | |
| 300 | 305 | 310 | |
| gca atg ggg tta aga att agc tca tca ttc agc ttt ggt gga ttc acc | | | 1014 |
| Ala Met Gly Leu Arg Ile Ser Ser Phe Ser Phe Gly Gly Phe Thr | | | |
| 315 | 320 | 325 | |
| ttt aag aga aca agt gga tca tca gtc aag aga gaa gaa atg ctt | | | 1062 |
| Phe Lys Arg Thr Ser Gly Ser Ser Val Lys Arg Glu Glu Met Leu | | | |
| 330 | 335 | 340 | 345 |
| acg ggc aac ctt caa aca ttg aaa ata aga gtg cat gaa ggc tat gaa | | | 1110 |
| Thr Gly Asn Leu Gln Thr Leu Lys Ile Arg Val His Glu Gly Tyr Glu | | | |
| 350 | 355 | 360 | |
| gaa ttc aca atg gtc gga aga aga gca aca gcc att ctc aga aag gca | | | 1158 |
| Glu Phe Thr Met Val Gly Arg Arg Ala Thr Ala Ile Leu Arg Lys Ala | | | |
| 365 | 370 | 375 | |
| acc aga aga ttg att caa ttg ata gta agt ggg aga gat gaa caa tca | | | 1206 |
| Thr Arg Arg Leu Ile Gln Leu Ile Val Ser Gly Arg Asp Glu Gln Ser | | | |
| 380 | 385 | 390 | |

EQ-1-C2-1.ST25.txt

| | |
|---|------|
| att gct gaa gca ata att gta gcc atg gtg ttt tcg caa gaa gat tgc Ile Ala Glu Ala Ile Ile Val Ala Met Val Phe Ser Gln Glu Asp Cys 395 400 405 | 1254 |
| atg ata caa gca gtt cga ggc gat ttg aac ttc gtt aat aga gca aat Met Ile Gln Ala Val Arg Gly Asp Leu Asn Phe Val Asn Arg Ala Asn 410 415 420 425 | 1302 |
| cag cgc ttg aac ccc atg cat caa ctc ttg agg cat ttc caa aaa gat Gln Arg Leu Asn Pro Met His Gln Leu Leu Arg His Phe Gln Lys Asp 430 435 440 | 1350 |
| gca aaa gtg ctt ttc cag aat tgg ggg att gaa ccc atc gac aat gtg Ala Lys Val Leu Phe Gln Asn Trp Gly Ile Glu Pro Ile Asp Asn Val 445 450 455 | 1398 |
| atg gga atg att gga ata ttg cct gac atg acc cca agc acc gag atg Met Gly Met Ile Gly Ile Leu Pro Asp Met Thr Pro Ser Thr Glu Met 460 465 470 | 1446 |
| tca ttg aga gga gtg aga gtc agc aaa atg gga gtg gat gag tac tcc Ser Leu Arg Gly Val Arg Val Ser Lys Met Gly Val Asp Glu Tyr Ser 475 480 485 | 1494 |
| agc act gag aga gtg gtg agc att gac cgt ttt tta aga gtt cgg Ser Thr Glu Arg Val Val Val Ser Ile Asp Arg Phe Leu Arg Val Arg 490 495 500 505 | 1542 |
| gat caa agg gga aac ata cta ctg tcc cct gaa gag gtc agt gaa aca Asp Gln Arg Gly Asn Ile Leu Leu Ser Pro Glu Glu Val Ser Glu Thr 510 515 520 | 1590 |
| caa gga acg gaa aag ctg aca ata att tat tca tca tca atg atg tgg Gln Gly Thr Glu Lys Leu Thr Ile Ile Tyr Ser Ser Ser Met Met Trp 525 530 535 | 1638 |
| gag att aat ggt ccc gaa tca gtg ttg gtc aat act tat caa tgg atc Glu Ile Asn Gly Pro Glu Ser Val Leu Val Asn Thr Tyr Gln Trp Ile 540 545 550 | 1686 |
| atc agg aac tgg gaa att gtg aaa att caa tgg tca cag gat ccc aca Ile Arg Asn Trp Glu Ile Val Lys Ile Gln Trp Ser Gln Asp Pro Thr 555 560 565 | 1734 |
| atg tta tac aat aag ata gaa ttt gag cca ttc cag tcc ctg gtc cct Met Leu Tyr Asn Lys Ile Glu Phe Glu Pro Phe Gln Ser Leu Val Pro 570 575 580 585 | 1782 |
| agg gcc acc aga agc caa tac agc ggt ttc gta aga acc ctg ttt cag Arg Ala Thr Arg Ser Gln Tyr Ser Gly Phe Val Arg Thr Leu Phe Gln 590 595 600 | 1830 |
| caa atg cga gat gta ctt gga aca ttt gat act gct caa ata ata aaa Gln Met Arg Asp Val Leu Gly Thr Phe Asp Thr Ala Gln Ile Ile Lys 605 610 615 | 1878 |
| ctc ctc cct ttt gcc gct gct cct ccg gaa cag agt agg atg cag ttc Leu Leu Pro Phe Ala Ala Ala Pro Pro Glu Gln Ser Arg Met Gln Phe 620 625 630 | 1926 |

EQ-1-C2-1.ST25.txt

| | |
|---|------|
| tct tct ttg act gtt aat gta aga gga tcg gga atg agg ata ctt gta Ser Ser Leu Thr Val Asn Val Arg Gly Ser Gly Met Arg Ile Leu Val 635 640 645 | 1974 |
| aga ggc aat tcc cca gtg ttc aac tac aat aaa gcc act aag agg ctc Arg Gly Asn Ser Pro Val Phe Asn Tyr Asn Lys Ala Thr Lys Arg Leu 650 655 660 665 | 2022 |
| aca gtc ctc gga aaa gat gca ggt gcg ctt act gaa gac cca gat gaa Thr Val Leu Gly Lys Asp Ala Gly Ala Leu Thr Glu Asp Pro Asp Glu 670 675 680 | 2070 |
| ggt acg gct gga gta gaa tct gct gtt cta aga ggg ttt ctc att tta Gly Thr Ala Gly Val Glu Ser Ala Val Leu Arg Gly Phe Leu Ile Leu 685 690 695 | 2118 |
| ggt aaa gaa aac aag aga tat ggc cca gca cta agc atc aat gaa ctg Gly Lys Glu Asn Lys Arg Tyr Gly Pro Ala Leu Ser Ile Asn Glu Leu 700 705 710 | 2166 |
| agc aaa ctt gca aaa ggg gag aaa gct aat gtg cta att ggg caa ggg Ser Lys Leu Ala Lys Gly Glu Lys Ala Asn Val Leu Ile Gly Gln Gly 715 720 725 | 2214 |
| gac gtg gtg ttg gta atg aaa cg ^g aaa cgt gac tct agc ata ctt act Asp Val Val Leu Val Met Lys Arg Lys Arg Asp Ser Ser Ile Leu Thr 730 735 740 745 | 2262 |
| gac agc cag aca gcg acc aaa agg att cg ^g atg gcc atc aat Asp Ser Gln Thr Ala Thr Lys Arg Ile Arg Met Ala Ile Asn 750 755 | 2304 |
| tagtgtgaa ttgtttaaaa acgacacctgt ttctact | 2341 |

<210> 48
<211> 759
<212> PRT
<213> Equine influenza virus H3N8
<400> 48

Met Glu Arg Ile Lys Glu Leu Arg Asp Leu Met Ser Gln Ser Arg Thr
1 5 10 15

Arg Glu Ile Leu Thr Lys Thr Val Asp His Met Ala Ile Ile Lys
20 25 30

Lys Tyr Thr Ser Gly Arg Gln Glu Lys Asn Pro Ala Leu Arg Met Lys
35 40 45

Trp Met Met Ala Met Lys Tyr Pro Ile Thr Ala Asp Lys Arg Ile Met
50 55 60

EQ-1-C2-1.ST25.txt

Glu Met Ile Pro Glu Arg Asn Glu Gln Gly Gln Thr Leu Trp Ser Lys
65 70 75 80

Thr Asn Asp Ala Gly Ser Asp Arg Val Met Val Ser Pro Leu Ala Val
85 90 95

Thr Trp Trp Asn Arg Asn Gly Pro Thr Thr Ser Thr Ile His Tyr Pro
100 105 110

Lys Val His Lys Thr Tyr Phe Glu Lys Val Glu Arg Leu Lys His Gly
115 120 125

Thr Phe Gly Pro Val His Phe Arg Asn Gln Val Lys Ile Arg Arg Arg
130 135 140

Val Asp Val Asn Pro Gly His Ala Asp Leu Ser Ala Lys Glu Ala Gln
145 150 155 160

Asp Val Ile Met Glu Val Val Phe Pro Asn Glu Val Gly Ala Arg Ile
165 170 175

Leu Thr Ser Glu Ser Gln Leu Thr Ile Thr Lys Glu Lys Lys Glu Glu
180 185 190

Leu Gln Asp Cys Lys Ile Ala Pro Leu Met Val Ala Tyr Met Leu Glu
195 200 205

Arg Glu Leu Val Arg Lys Thr Arg Phe Leu Pro Val Ala Gly Gly Thr
210 215 220

Ser Ser Val Tyr Ile Glu Val Leu His Leu Thr Gln Gly Thr Cys Trp
225 230 235 240

Glu Gln Met Tyr Thr Pro Gly Gly Glu Val Arg Asn Asp Asp Ile Asp
245 250 255

Gln Ser Leu Ile Ile Ala Ala Arg Asn Ile Val Arg Arg Ala Thr Val
260 265 270

Ser Ala Asp Pro Leu Ala Ser Leu Leu Glu Met Cys His Ser Thr Gln
275 280 285

Ile Gly Gly Ile Arg Met Val Asp Ile Leu Lys Gln Asn Pro Thr Glu
290 295 300

EQ-1-C2-1.ST25.txt

Glu Gln Ala Val Asp Ile Cys Lys Ala Ala Met Gly Leu Arg Ile Ser
305 310 315 320

Ser Ser Phe Ser Phe Gly Gly Phe Thr Phe Lys Arg Thr Ser Gly Ser
325 330 335

Ser Val Lys Arg Glu Glu Met Leu Thr Gly Asn Leu Gln Thr Leu
340 345 350

Lys Ile Arg Val His Glu Gly Tyr Glu Glu Phe Thr Met Val Gly Arg
355 360 365

Arg Ala Thr Ala Ile Leu Arg Lys Ala Thr Arg Arg Leu Ile Gln Leu
370 375 380

Ile Val Ser Gly Arg Asp Glu Gln Ser Ile Ala Glu Ala Ile Ile Val
385 390 395 400

Ala Met Val Phe Ser Gln Glu Asp Cys Met Ile Gln Ala Val Arg Gly
405 410 415

Asp Leu Asn Phe Val Asn Arg Ala Asn Gln Arg Leu Asn Pro Met His
420 425 430

Gln Leu Leu Arg His Phe Gln Lys Asp Ala Lys Val Leu Phe Gln Asn
435 440 445

Trp Gly Ile Glu Pro Ile Asp Asn Val Met Gly Met Ile Gly Ile Leu
450 455 460

Pro Asp Met Thr Pro Ser Thr Glu Met Ser Leu Arg Gly Val Arg Val
465 470 475 480

Ser Lys Met Gly Val Asp Glu Tyr Ser Ser Thr Glu Arg Val Val Val
485 490 495

Ser Ile Asp Arg Phe Leu Arg Val Arg Asp Gln Arg Gly Asn Ile Leu
500 505 510

Leu Ser Pro Glu Glu Val Ser Glu Thr Gln Gly Thr Glu Lys Leu Thr
515 520 525

Ile Ile Tyr Ser Ser Ser Met Met Trp Glu Ile Asn Gly Pro Glu Ser
530 535 540

EQ-1-C2-1.ST25.txt

Val Leu Val Asn Thr Tyr Gln Trp Ile Ile Arg Asn Trp Glu Ile Val
545 550 555 560

Lys Ile Gln Trp Ser Gln Asp Pro Thr Met Leu Tyr Asn Lys Ile Glu
565 570 575

Phe Glu Pro Phe Gln Ser Leu Val Pro Arg Ala Thr Arg Ser Gln Tyr
580 585 590

Ser Gly Phe Val Arg Thr Leu Phe Gln Gln Met Arg Asp Val Leu Gly
595 600 605

Thr Phe Asp Thr Ala Gln Ile Ile Lys Leu Leu Pro Phe Ala Ala Ala
610 615 620

Pro Pro Glu Gln Ser Arg Met Gln Phe Ser Ser Leu Thr Val Asn Val
625 630 635 640

Arg Gly Ser Gly Met Arg Ile Leu Val Arg Gly Asn Ser Pro Val Phe
645 650 655

Asn Tyr Asn Lys Ala Thr Lys Arg Leu Thr Val Leu Gly Lys Asp Ala
660 665 670

Gly Ala Leu Thr Glu Asp Pro Asp Glu Gly Thr Ala Gly Val Glu Ser
675 680 685

Ala Val Leu Arg Gly Phe Leu Ile Leu Gly Lys Glu Asn Lys Arg Tyr
690 695 700

Gly Pro Ala Leu Ser Ile Asn Glu Leu Ser Lys Leu Ala Lys Gly Glu
705 710 715 720

Lys Ala Asn Val Leu Ile Gly Gln Gly Asp Val Val Leu Val Met Lys
725 730 735

Arg Lys Arg Asp Ser Ser Ile Leu Thr Asp Ser Gln Thr Ala Thr Lys
740 745 750

Arg Ile Arg Met Ala Ile Asn
755

EQ-1-C2-1.ST25.txt

<211> 2277
 <212> DNA
 <213> Equine influenza virus H3N8

| | | | | | | |
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| <400> | 49 | | | | | |
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| acaaaaacta | ctgtggacca | catggccata | atcaagaaat | acacatcagg | aagacaagag | 120 |
| aagaaccccg | cacttaggat | gaagtggatg | atggcaatga | aatacccaat | tacagcagat | 180 |
| aagaggataa | tggaaatgat | tcctgagaga | aatgaacagg | ggcaaaccct | ttggagcaaa | 240 |
| acgaacgatg | ctggctcaga | ccgcgtaatg | gtatcacctc | tggcagtgac | atggtggaat | 300 |
| aggaatggac | caacaacgag | cacaattcat | tatccaaaag | tccacaaaac | ttattttgaa | 360 |
| aaagttgaaa | gattaaaaca | cggAACCTT | ggccccgttc | atTTTAGGAA | tcaagtcaag | 420 |
| ataagacgga | gagttgatgt | aaaccctgg | cacgcggacc | tcagtgcCAA | agaagcaca | 480 |
| gatgtgatca | tggaagttgt | tttcccaa | atTTAGGAG | ccagaattct | aacatcgaa | 540 |
| tcacaactaa | caataaccaa | agagaaaaaa | gaagaacttc | aggactgcaa | aattgcccc | 600 |
| ttgatggtag | catacatgct | agaaagagag | ttggTCCGAA | aaacaagatt | cctcccagt | 660 |
| gctggcggaa | caagcagtgt | atacattgaa | gtgttgcatc | tgactcagg | aacatgctgg | 720 |
| gaacaaatgt | acaccccagg | aggagaagtt | agaaacgatg | acattgatca | aagttaatt | 780 |
| attgctgccc | ggaacatagt | gagaagagcg | acagtatcag | cagatccact | agcatccctg | 840 |
| ctgaaatgt | gccacagtac | acagattgg | ggaataagga | tggtagacat | ccttaagcag | 900 |
| aatccaacag | aggaacaagc | tgtggatata | tgcaaagcag | caatggggtt | aagaattagc | 960 |
| tcatcattca | gctttggtgg | attcacctt | aagagaacaa | gtggatcatc | agtcaagaga | 1020 |
| gaagaagaaa | tgcttacggg | caaccttcaa | acattgaaaa | taagagtgcA | tgaaggctat | 1080 |
| gaagaattca | caatggtcgg | aagaagagca | acagccattc | tcaGAAAGGC | aaccagaaga | 1140 |
| ttgattcaat | tgatagtaag | tggagagat | gaacaatcaa | ttgctgaagc | aataattgt | 1200 |
| gccatggtgt | tttcgcaaga | agattgcatt | atacaagcag | ttcgaggcga | tttgaacttc | 1260 |
| gttaatagag | caaatcagcg | cttgaacccc | atgcattcaac | tcttgaggca | tttccaaaaa | 1320 |
| gatgcaaaag | tgctttcca | gaattgggg | attgaaccca | tgcataatgt | gatggaaatg | 1380 |
| attggaatat | tgcctgacat | gaccccaagc | accgagatgt | cattgagagg | agtgagagtc | 1440 |
| agcaaaatgg | gagtggatga | gtactccagc | actgagagag | ttgtggtgag | cattgaccgt | 1500 |
| ttttaagag | ttcgggatca | aaggggaaac | atactactgt | cccctgaaga | ggtcagtgaa | 1560 |
| acacaaggaa | cggAAAAGCT | gacaataatt | tattcatcat | caatgatgt | ggagattaat | 1620 |

EQ-1-C2-1.ST25.txt

| | |
|--|------|
| ggccccgaat cagtgttggg caatacttat caatggatca tcaggaactg ggaaatttgt | 1680 |
| aaaattcaat ggtcacagga tcccacaatg ttataacaata agatagaatt tgagccattc | 1740 |
| cagtcctcg tcccttagggc caccagaagc caatacagcg gttcgtaag aaccctgttt | 1800 |
| cagcaaatgc gagatgtact tggAACATTt gatactgctc aaataataaa actcctccct | 1860 |
| tttgcgcgtg ctccTCCGGA acagagtagg atgcagttct cttcttgac tgttaatgta | 1920 |
| agaggatcgg gaatgaggat acttgttAAGA ggcaattccc cagtgttcaa ctacaataaa | 1980 |
| gccactaaga ggctcacagt cctcgaaaaa gatgcaggtg cgcttactga agacccagat | 2040 |
| gaaggtacgg ctggagtaga atctgctgtt ctaagaggggt ttctcatttt aggtaaaagaa | 2100 |
| aacaagagat atggcccagc actaagcatc aatgaactga gcaaaacttgc aaaaggggag | 2160 |
| aaagctaattg tgcttaattgg gcaaggggac gtgggtttgg taatgaaaacg gaaacgtgac | 2220 |
| tctagcatac ttactgacaa ccaqacagcq accaaaqqa ttccggatggc catcaat | 2277 |

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<210> 50
<211> 891
<212> DNA
<213> Equine influenza virus H3N8
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<220>
<221> CDS
<222> (27)...(716)
<223>

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<400> 50
agcaaaaagc a gggtgacaaa aacata atg gat tcc aac act gtg tca agc ttt
Met Asp Ser Asn Thr Val Ser Ser Phe
1 5

cag gta gac tgt ttt ctt tgg cat gtc cgc aaa cga ttt gca gac caa
Gln Val Asp Cys Phe Leu Trp His Val Arg Lys Arg Phe Ala Asp Gln
10 15 20 25

gaa ctg ggt gat gcc cca ttc ctt gac cgg ctt cgc cga gac cag aag
Glu Leu Gly Asp Ala Pro Phe Leu Asp Arg Leu Arg Arg Asp Gln Lys
30 35 40

tcc cta aaa gga aga ggt agc act ctt ggt ctg gac atc gaa aca gcc
Ser Leu Lys Gly Arg Gly Ser Thr Leu Gly Leu Asp Ile Glu Thr Ala
45 50 55

act cgt gca gga aag cag ata gtg gag cag att ctg gaa gag gaa tca
Thr Arg Ala Gly Lys Gln Ile Val Glu Gln Ile Leu Glu Glu Glu Ser
60 65 70

gat gag gca ctt aaa atg acc att gcc tct gtt cct gct tca cgc tac
Asp Glu Ala Leu Lys Met Thr Ile Ala Ser Val Pro Ala Ser Arg Tyr
75 80 85

```

EQ-1-C2-1.ST25.txt

| | |
|---|--|
| tta act gac atg act ctt gat gag atg tca aga gac tgg ttc atg ctc Leu Thr Asp Met Thr Leu Asp Glu Met Ser Arg Asp Trp Phe Met Leu 90 95 100 105 | 341 |
| atg ccc aag cag aaa gta aca ggc tcc cta tgt ata aga atg gac cag Met Pro Lys Gln Lys Val Thr Gly Ser Leu Cys Ile Arg Met Asp Gln 110 115 120 | 389 |
| gca atc atg gat aag aac atc ata ctt aaa gca aac ttt agt gtg att Ala Ile Met Asp Lys Asn Ile Ile Leu Lys Ala Asn Phe Ser Val Ile 125 130 135 | 437 |
| ttc gaa agg ctg gag aca cta ata cta ctt aga gcc ttc acc gaa gaa Phe-Glu Arg-Leu Glu Thr Leu Ile Leu Leu Arg Ala Phe Thr Glu Glu 140 145 150 | 485 |
| gga gca gtc gtt ggc gaa att tca cca ttg cct tct ctt cca gga cat Gly Ala Val Val Gly Glu Ile Ser Pro Leu Pro Ser Leu Pro Gly His 155 160 165 | 533 |
| act aat gag gat gtc aaa aat gca att ggg gtc ctc atc gga gga ctt Thr Asn Glu Asp Val Lys Asn Ala Ile Gly Val Leu Ile Gly Gly Leu 170 175 180 185 | 581 |
| aaa tgg aat gat aat acg gtt aga atc tct gaa act cta cag aga ttc Lys Trp Asn Asp Asn Thr Val Arg Ile Ser Glu Thr Leu Gln Arg Phe 190 195 200 | 629 |
| gct tgg aga agc agt cat gag aat ggg aga cct tca ttc cct cca aag Ala Trp Arg Ser Ser His Glu Asn Gly Arg Pro Ser Phe Pro Pro Lys 205 210 215 | 677 |
| cag aaa cga aaa atg gag aga aca att gag cca gaa gtt tgaagaaata Gln Lys Arg Lys Met Glu Arg Thr Ile Glu Pro Glu Val 220 225 230 | 726 |
| agatggttga ttgaagaagt gcgacataga ttgaaaaata cagaaaatag ttttgaacaa | 786 |
| ataacattta tgcaaggcatt acaactattt cttgaagtag gacaagagat aagaactttc | 846 |
| tcgtttcagc ttatttaatg ataaaaaaca cccttgtttc tacta | 891 |
| | |
| <210> 51 | |
| <211> 230 | |
| <212> PRT | |
| <213> Equine influenza virus H3N8 | |
| | |
| <400> 51 | |
| | |
| Met Asp Ser Asn Thr Val Ser Ser Phe Gln Val Asp Cys Phe Leu Trp 1 5 10 15 | Met Asp Ser Asn Thr Val Ser Ser Phe Gln Val Asp Cys Phe Leu Trp 1 5 10 15 |
| | |
| His Val Arg Lys Arg Phe Ala Asp Gln Glu Leu Gly Asp Ala Pro Phe 20 25 30 | His Val Arg Lys Arg Phe Ala Asp Gln Glu Leu Gly Asp Ala Pro Phe 20 25 30 |
| | |
| Leu Asp Arg Leu Arg Arg Asp Gln Lys Ser Leu Lys Gly Arg Gly Ser | Leu Asp Arg Leu Arg Arg Asp Gln Lys Ser Leu Lys Gly Arg Gly Ser |

35

40

45

Thr Leu Gly Leu Asp Ile Glu Thr Ala Thr Arg Ala Gly Lys Gln Ile
 50 55 60

Val Glu Gln Ile Leu Glu Glu Ser Asp Glu Ala Leu Lys Met Thr
 65 70 75 80

Ile Ala Ser Val Pro Ala Ser Arg Tyr Leu Thr Asp Met Thr Leu Asp
 85 90 95

Glu Met Ser Arg Asp Trp Phe Met Leu Met Pro Lys Gln Lys Val Thr
 100 105 110

Gly Ser Leu Cys Ile Arg Met Asp Gln Ala Ile Met Asp Lys Asn Ile
 115 120 125

Ile Leu Lys Ala Asn Phe Ser Val Ile Phe Glu Arg Leu Glu Thr Leu
 130 135 140

Ile Leu Leu Arg Ala Phe Thr Glu Glu Gly Ala Val Val Gly Glu Ile
 145 150 155 160

Ser Pro Leu Pro Ser Leu Pro Gly His Thr Asn Glu Asp Val Lys Asn
 165 170 175

Ala Ile Gly Val Leu Ile Gly Gly Leu Lys Trp Asn Asp Asn Thr Val
 180 185 190

Arg Ile Ser Glu Thr Leu Gln Arg Phe Ala Trp Arg Ser Ser His Glu
 195 200 205

Asn Gly Arg Pro Ser Phe Pro Pro Lys Gln Lys Arg Lys Met Glu Arg
 210 215 220

Thr Ile Glu Pro Glu Val
 225 230

<210> 52
 <211> 690
 <212> DNA
 <213> Equine influenza virus H3N8

<400> 52
 atggattcca acactgtgtc aagctttcag gtagactgtt ttctttggca tgtccgcaaa 60

EQ-1-C2-1.ST25.txt

| | |
|--|-----|
| cgatttgcag accaagaact gggtgatgcc ccattccttg accggcttcg ccgagaccag | 120 |
| aagtccctaa aaggaagagg tagcaacttt ggtctggaca tcgaaacagc cactcgtgca | 180 |
| ggaaaagcaga tagtggagca gattctggaa gaggaatcag atgaggcact taaaatgacc | 240 |
| atgcctctg ttccctgcttc acgctactta actgacatga ctcttgatga gatgtcaaga | 300 |
| gactggttca tgctcatgcc caagcagaaa gtaacaggct ccctatgtat aagaatggac | 360 |
| caggcaatca tggataagaa catcatactt aaagcaaact ttagtgtat ttgcgaaagg | 420 |
| ctggagacac taatactact tagagccttc accgaagaag gagcagtcgt tggcgaatt | 480 |
| tcaccattgc cttctttcc aggcataact aatgaggatg tcaaaaatgc aattggggtc | 540 |
| ctcatcgag gacttaaatg gaatgataat acggttagaa tctctgaaac tctacagaga | 600 |
| ttcgcttggaa gaagcagtca tgagaatggg agaccttcat tccctccaaa gcagaaacga | 660 |
| aaaatggaga gaacaattga gccagaagtt | 690 |

<210> 53

<211> 888

<212> DNA

<213> Equine influenza virus H3N8

| | |
|--|-----|
| <400> 53 | |
| caaaagcagg gtgacaaaaa catgatggat tccaacactg tgtcaagctt tcaggttagac | 60 |
| tgtttcttt ggcatgtccg caaacgattt gcagaccaag aactgggtga tgccccattc | 120 |
| cttgcacggc ttgcggaga ccagaagtcc ctAAAAGGAA gaggtgcac tctggctg | 180 |
| gacatcgaaa cagccactcg tgcaggaaag cagatgtgg agcagattct ggaagaggaa | 240 |
| tcagatgagg cactaaaaat gaccattgc tctgttcctg cttcacgcta cttaactgac | 300 |
| atgactctt atgagatgtc aagagactgg ttcatgctca tgcccaagca gaaagtaaca | 360 |
| ggctccstat gtataagaat ggaccaggca atcatggata agaacatcat acttaaagca | 420 |
| aacttttagtg tgatttcga aaggctggag acactaatac tacttagagc cttcacggaa | 480 |
| gaaggaggcag tcgttggcga aatttcacca ttgccttc ttcaggaca tactaatgag | 540 |
| gatgtcaaaa atgcaattgg ggtcctcatc ggaggactta aatggaatga taatacggtt | 600 |
| agaatctctg aaactctaca gagattcgct tggagaagca gtcatgagaa tgggagacct | 660 |
| tcattccctc caaagcagaa acgaaaaatg gagagaacaa ttgagccaga agtttgaaga | 720 |
| aataagatgg ttgattgaag aagtgcgaca tagattgaaa aatacagaaa atagtttga | 780 |
| acaaataaca tttatgcaag ctttacaact attgcttcaa gtagaacaag agataagaac | 840 |
| tttctcgaaa cagtttattt aatgataaaa aacacccttg tttctact | 888 |

EQ-1-C2-1.ST25.txt

<210> 54
<211> 468
<212> DNA
<213> Equine influenza virus H3N8

<220>
<221> CDS
<222> (3)...(293)
<223>

<400> 54
 ac ttt agt gtg att ttc gaa agg ctg gag aca cta ata cta ctt aga 47
 Phe Ser Val Ile Phe Glu Arg Leu Glu Thr Leu Ile Leu Leu Arg
 1 5 10 15

 gcc ttc acc gaa gaa gga gca gtc gtt ggc gaa att tca cca ttg cct 95
 Ala Phe Thr Glu Glu Gly Ala Val Val Gly Glu Ile Ser Pro Leu Pro
 20 25 30

 tct ctt cca gga cat act aat gag gat gtc aaa aat gca att ggg gtc 143
 Ser Leu Pro Gly His Thr Asn Glu Asp Val Lys Asn Ala Ile Gly Val
 35 40 45

 ctc atc gga gga ctt aaa tgg aat gat aat acg gtt aga atc tct gaa 191
 Leu Ile Gly Gly Leu Lys Trp Asn Asp Asn Thr Val Arg Ile Ser Glu
 50 55 60

 act cta cag aga ttc gct cg^g aga agc agt cat gag aat ggg aga cct 239
 Thr Leu Gln Arg Phe Ala Arg Ser Ser His Glu Asn Gly Arg Pro
 65 70 75

 tca ttc cct cca aag cag aaa cga aaa atg gag aga aca att gag cca 287
 Ser Phe Pro Pro Lys Gln Lys Arg Lys Met Glu Arg Thr Ile Glu Pro
 80 85 90 95

 gaa gtt tgaagaaaata agatgggttga ttgaagaagt gcgacataga ttgaaaaata 343
 Glu Val

 cagaaaaatag ttttgaacaa ataacattta tgcaaggcctt acaactattg cttgaagtag 403

 aacaagagat aagaactttc tcgtttcagc ttatattaatg ataaaaaaaca cccttgttcc 463

 tacta 468

<210> 55
<211> 97
<212> PRT
<213> Equine influenza virus H3N8

<400> 55

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Phe | Ser | Val | Ile | Phe | Glu | Arg | Leu | Glu | Thr | Leu | Ile | Leu | Leu | Arg | Ala |
| 1 | | | | 5 | | | | | 10 | | | | | | 15 |

EQ-1-C2-1.ST25.txt

Phe Thr Glu Glu Gly Ala Val Val Gly Glu Ile Ser Pro Leu Pro Ser
20 25 30

Leu Pro Gly His Thr Asn Glu Asp Val Lys Asn Ala Ile Gly Val Leu
35 40 45

Ile Gly Gly Leu Lys Trp Asn Asp Asn Thr Val Arg Ile Ser Glu Thr
50 55 60

Leu Gln Arg Phe Ala Arg Arg Ser Ser His Glu Asn Gly Arg Pro Ser
65 70 75 80

Phe Pro Pro Lys Gln Lys Arg Lys Met Glu Arg Thr Ile Glu Pro Glu
85 90 95

Val

<210> 56
<211> 293
<212> DNA
<213> Equine influenza virus H3N8

<400> 56
acttttagtgt gattttcgaa aggctggaga cactaatact acttagagcc ttcaccgaag 60
aaggagcagt cgttggcgaa atttcaccat tgccttctct tccaggacat actaatgagg 120
atgtcaaaaa tgcaattggg gtcctcatcg gaggacttaa atggaatgat aatacggta 180
gaatctctga aactctacag agattcgctc ggagaagcag tcatgagaat gggagacctt 240
catccctcc aaagcagaaa cgaaaaatgg agagaacaat tgagccagaa gtt 293

<210> 57
<211> 888
<212> DNA
<213> Equine influenza virus H3N8

<220>
<221> CDS
<222> (27)..(716)
<223>

<400> 57
agcaaaagca gggtgacaaa aacata atg gat tcc aac act gtg tca agc ttt 53
Met Asp Ser Asn Thr Val Ser Ser Phe
1 5

cag gta gac tgt ttt ctt tgg cat gtc cgc aaa cga ttt gca gac caa 101
Gln Val Asp Cys Phe Leu Trp His Val Arg Lys Arg Phe Ala Asp Gln

EQ-1-C2-1.ST25.txt

| 10 | 15 | 20 | 25 | |
|---|-----|-----|-----|-----|
| gaa ctg ggt gat gcc cca ttc ctt gac cg | 30 | 35 | 40 | 149 |
| Glu Leu Gly Asp Ala Pro Phe Leu Asp Arg | | | | |
| Leu Arg Arg Asp Gln Lys | | | | |
| tcc cta aaa gga aga ggt agc act ctt ggt ctg gac atc gaa aca gcc | 45 | 50 | 55 | 197 |
| Ser Leu Lys Gly Arg Gly Ser Thr Leu Gly Leu Asp Ile Glu Thr Ala | | | | |
| act cgt gca gga aag cag ata gtg gag cag att ctg gaa gag gaa tca | 60 | 65 | 70 | 245 |
| Thr Arg Ala Gly Lys Gln Ile Val Glu Gln Ile Leu Glu Glu Ser | | | | |
| gat gag gca ctt aaa atg acc att gcc tct gtt cct gct tca cgc tac | 75 | 80 | 85 | 293 |
| Asp Glu Ala Leu Lys Met Thr Ile Ala Ser Val Pro Ala Ser Arg Tyr | | | | |
| tta act gac atg act ctt gat gag atg tca aga gac tgg ttc atg ctc | 90 | 95 | 100 | 341 |
| Leu Thr Asp Met Thr Leu Asp Glu Met Ser Arg Asp Trp Phe Met Leu | | | | |
| atg ccc aag cag aaa gta aca ggc tcc cta tgt ata aga atg gac cag | 110 | 115 | 120 | 389 |
| Met Pro Lys Gln Lys Val Thr Gly Ser Leu Cys Ile Arg Met Asp Gln | | | | |
| gca atc atg gat aag aac atc ata ctt aaa gca aac ttt agt gtg att | 125 | 130 | 135 | 437 |
| Ala Ile Met Asp Lys Asn Ile Ile Leu Lys Ala Asn Phe Ser Val Ile | | | | |
| ttc gaa agg ctg gag aca cta ata cta ctt aga gcc ttc acc gaa gaa | 140 | 145 | 150 | 485 |
| Phe Glu Arg Leu Glu Thr Leu Ile Leu Leu Arg Ala Phe Thr Glu Glu | | | | |
| gga gca gtc gtt ggc gaa att tca cca ttg cct tct ctt cca gga cat | 155 | 160 | 165 | 533 |
| Gly Ala Val Val Gly Glu Ile Ser Pro Leu Pro Ser Leu Pro Gly His | | | | |
| act aat gag gat gtc aaa aat gca att ggg gtc ctc atc gga gga ctt | 170 | 175 | 180 | 581 |
| Thr Asn Glu Asp Val Lys Asn Ala Ile Gly Val Leu Ile Gly Gly Leu | | | | |
| aaa tgg aat gat aat acg gtt aga atc tct gaa act cta cag aga ttc | 190 | 195 | 200 | 629 |
| Lys Trp Asn Asp Asn Thr Val Arg Ile Ser Glu Thr Leu Gln Arg Phe | | | | |
| gct tgg aga agc agt cat gag aat ggg aga cct tca ttc cct cca aag | 205 | 210 | 215 | 677 |
| Ala Trp Arg Ser Ser His Glu Asn Gly Arg Pro Ser Phe Pro Pro Lys | | | | |
| cag aaa cga aaa atg gag aga aca att gag cca gaa gtt tgaagaaaata | 220 | 225 | 230 | 726 |
| Gln Lys Arg Lys Met Glu Arg Thr Ile Glu Pro Glu Val | | | | |
| agatggttga ttgaagaagt gcgacataga ttgaaaaata cagaaaatag ttttgaacaa | | | | 786 |
| ataacattta tgcaaggcattt acaactattt cttgaagtag aacaagagat aagaactttc | | | | 846 |
| tcgtttcagc ttatataatg ataaaaaaca cccttgtttc ta | | | | 888 |

EQ-1-C2-1.ST25.txt

<210> 58
<211> 230
<212> PRT
<213> Equine influenza virus H3N8

<400> 58

Met Asp Ser Asn Thr Val Ser Ser Phe Gln Val Asp Cys Phe Leu Trp
1 5 10 15

His Val Arg Lys Arg Phe Ala Asp Gln Glu Leu Gly Asp Ala Pro Phe
20 25 30

Leu Asp Arg Leu Arg Arg Asp Gln Lys Ser Leu Lys Gly Arg Gly Ser
35 40 45

Thr Leu Gly Leu Asp Ile Glu Thr Ala Thr Arg Ala Gly Lys Gln Ile
50 55 60

Val Glu Gln Ile Leu Glu Glu Ser Asp Glu Ala Leu Lys Met Thr
65 70 75 80

Ile Ala Ser Val Pro Ala Ser Arg Tyr Leu Thr Asp Met Thr Leu Asp
85 90 95

Glu Met Ser Arg Asp Trp Phe Met Leu Met Pro Lys Gln Lys Val Thr
100 105 110

Gly Ser Leu Cys Ile Arg Met Asp Gln Ala Ile Met Asp Lys Asn Ile
115 120 125

Ile Leu Lys Ala Asn Phe Ser Val Ile Phe Glu Arg Leu Glu Thr Leu
130 135 140

Ile Leu Leu Arg Ala Phe Thr Glu Glu Gly Ala Val Val Gly Glu Ile
145 150 155 160

Ser Pro Leu Pro Ser Leu Pro Gly His Thr Asn Glu Asp Val Lys Asn
165 170 175

Ala Ile Gly Val Leu Ile Gly Gly Leu Lys Trp Asn Asp Asn Thr Val
180 185 190

Arg Ile Ser Glu Thr Leu Gln Arg Phe Ala Trp Arg Ser Ser His Glu
195 200 205

EQ-1-C2-1.ST25.txt

Asn Gly Arg Pro Ser Phe Pro Pro Lys Gln Lys Arg Lys Met Glu Arg
210 215 220

Thr Ile Glu Pro Glu Val
225 230

<210> 59
<211> 690
<212> DNA
<213> Equine influenza virus H3N8

<400> 59
atggattcca acactgtgtc aagctttcag gtagactgtt ttctttggca tgtccgcaaa 60
cgatttgcag accaagaact gggtgatgcc ccattccttg accggcttcg ccgagaccag 120
aagtccctaa aaggaagagg tagcactttt ggtctggaca tcgaaacagc cactcgtgca 180
ggaaagcaga tagtggagca gattctggaa gaggaatcag atgaggcact taaaatgacc 240
attgcctctg ttccctgcttc acgctactta actgacatga ctcttgatga gatgtcaaga 300
gactggttca tgctcatgcc caagcagaaa gtaacaggct ccctatgtat aagaatggac 360
caggcaatca tggataagaa catcatactt aaagcaaact ttagtgtgat ttccgaaagg 420
ctggagacac taatactact taggccttc accgaagaag gagcagtcgt tggcggaaatt 480
tcaccattgc cttctttcc aggacatact aatgaggatg tcaaaaatgc aattggggtc 540
ctcatcgag gacttaaatg gaatgataat acggtagaa tctctgaaac tctacagaga 600
ttcgcttggaa gaagcagtca tgagaatggg agaccttcat tccctccaaa gcagaaacga 660
aaaatggaga gaacaattga gccagaagtt 690

<210> 60
<211> 21
<212> DNA
<213> Artificial sequence

<220>
<223> Synthetic Primer

<400> 60
agcaaaggcag gtgacaaaaa c 21

<210> 61
<211> 19
<212> DNA
<213> Artificial sequence

<220>

EQ-1-C2-1.ST25.txt

<223> Synthetic Primer

<400> 61
agttagaaaaca agggtgttt

19

<210> 62
<211> 1229
<212> DNA
<213> Equine influenza virus H3N8<220>
<221> CDS
<222> (36)..(1229)
<223>

| | | |
|---|--|-----|
| <400> 62 | | |
| gaattcggct tagcaaaagc aggcaaacta tttga atg gat gtc aat ccg act | | 53 |
| Met Asp Val Asn Pro Thr | | |
| 1 5 | | |
| cta ctc ttc tta aag gtg cca gcg caa aat gct ata agc aca aca ttc | | 101 |
| Leu Leu Phe Leu Lys Val Pro Ala Gln Asn Ala Ile Ser Thr Thr Phe | | |
| 10 15 20 | | |
| cct tat act gga gat cct ccc tac agt cat gga aca ggg aca gga tac | | 149 |
| Pro Tyr Thr Gly Asp Pro Pro Tyr Ser His Gly Thr Gly Thr Gly Tyr | | |
| 25 30 35 | | |
| acc atg gat act gtc aac aga aca cat caa tac tca gaa aag ggg aaa | | 197 |
| Thr Met Asp Thr Val Asn Arg Thr His Gln Tyr Ser Glu Lys Gly Lys | | |
| 40 45 50 | | |
| tgg aca aca aac act gag att gga gca cca caa ctt aat cca atc gat | | 245 |
| Trp Thr Thr Asn Thr Glu Ile Gly Ala Pro Gln Leu Asn Pro Ile Asp | | |
| 55 60 65 70 | | |
| gga ccg ctt cct gaa gac aat gaa cca agt ggg tac gcc caa aca gat | | 293 |
| Gly Pro Leu Pro Glu Asp Asn Glu Pro Ser Gly Tyr Ala Gln Thr Asp | | |
| 75 80 85 | | |
| tgt gta ttg gaa gca atg gct ttc ctt gaa gaa tcc cat ccc gga atc | | 341 |
| Cys Val Leu Glu Ala Met Ala Phe Leu Glu Ser His Pro Gly Ile | | |
| 90 95 100 | | |
| ttt gaa aat tcg tgt ctt gaa aca atg gag gtg gtt cag cag aca aga | | 389 |
| Phe Glu Asn Ser Cys Leu Glu Thr Met Glu Val Val Gln Gln Thr Arg | | |
| 105 110 115 | | |
| gtg gac aaa cta aca caa ggc cga caa act tac gat tgg acc ttg aat | | 437 |
| Val Asp Lys Leu Thr Gln Gly Arg Gln Thr Tyr Asp Trp Thr Leu Asn | | |
| 120 125 130 | | |
| agg aat caa cct gcc gca aca gca ctt gct aat aca att gaa gtg ttc | | 485 |
| Arg Asn Gln Pro Ala Ala Thr Ala Leu Ala Asn Thr Ile Glu Val Phe | | |
| 135 140 145 150 | | |
| aga tca aat gat ctg act tcc agt gag tca ggg aga tta atg gac ttc | | 533 |

EQ-1-C2-1.ST25.txt

| | | | |
|---|-----|-----|------|
| Arg Ser Asn Asp Leu Thr Ser Ser Glu Ser Gly Arg Leu Met Asp Phe | | | |
| 155 | 160 | 165 | |
| ctc aaa gat gtc atg gag tcc atg aac aag gaa gaa atg gaa ata aca | | | 581 |
| Leu Lys Asp Val Met Glu Ser Met Asn Lys Glu Glu Met Glu Ile Thr | | | |
| 170 | 175 | 180 | |
| aca cac ttc caa cgg aag aga aga gta aga gac aac atg aca aag aga | | | 629 |
| Thr His Phe Gln Arg Lys Arg Arg Val Arg Asp Asn Met Thr Lys Arg | | | |
| 185 | 190 | 195 | |
| atg gtg aca cag aga acc ata ggg aag aaa aaa caa cga tta aac aga | | | 677 |
| Met Val Thr Gln Arg Thr Ile Gly Lys Lys Lys Gln Arg Leu Asn Arg | | | |
| 200 | 205 | 210 | |
| aag agc tat ctg atc agg gca tta acc tta aac aca atg acc aag gac | | | 725 |
| Lys Ser Tyr Leu Ile Arg Ala Leu Thr Leu Asn Thr Met Thr Lys Asp | | | |
| 215 | 220 | 225 | 230 |
| gct gag aga ggg aaa ttg aaa cga cga gca att gca acc cca gga atg | | | 773 |
| Ala Glu Arg Gly Lys Leu Lys Arg Arg Ala Ile Ala Thr Pro Gly Met | | | |
| 235 | 240 | 245 | |
| cag ata aga ggg ttt gta tat ttt gtt gaa aca tta gcc cga aga ata | | | 821 |
| Gln Ile Arg Gly Phe Val Tyr Phe Val Glu Thr Leu Ala Arg Arg Ile | | | |
| 250 | 255 | 260 | |
| tgt gaa aag ctt gaa caa tca gga ttg cca gtt ggc ggt aat gag aaa | | | 869 |
| Cys Glu Lys Leu Glu Gln Ser Gly Leu Pro Val Gly Gly Asn Glu Lys | | | |
| 265 | 270 | 275 | |
| aag gcc aaa ctg gct aat gtc gtc aga aaa atg atg act aat tcc caa | | | 917 |
| Lys Ala Lys Leu Ala Asn Val Val Arg Lys Met Met Thr Asn Ser Gln | | | |
| 280 | 285 | 290 | |
| gac act gaa ctc tcc ttc acc atc act ggg gac aat acc aaa tgg aat | | | 965 |
| Asp Thr Glu Leu Ser Phe Thr Ile Thr Gly Asp Asn Thr Lys Trp Asn | | | |
| 295 | 300 | 305 | 310 |
| gaa aat cag aac cca cgc atg ttc ctg gca atg atc aca tac ata act | | | 1013 |
| Glu Asn Gln Asn Pro Arg Met Phe Leu Ala Met Ile Thr Tyr Ile Thr | | | |
| 315 | 320 | 325 | |
| aga aac cag cca gaa tgg ttc aga aat gtt cta agc att gca ccg att | | | 1061 |
| Arg Asn Gln Pro Glu Trp Phe Arg Asn Val Leu Ser Ile Ala Pro Ile | | | |
| 330 | 335 | 340 | |
| atg ttc tca aat aaa atg gca aga ctg ggg aaa gga tat atg ttt gaa | | | 1109 |
| Met Phe Ser Asn Lys Met Ala Arg Leu Gly Lys Gly Tyr Met Phe Glu | | | |
| 345 | 350 | 355 | |
| agc aaa agt atg aaa ttg aga actcaa ata cca gca gaa atg ctc gca | | | 1157 |
| Ser Lys Ser Met Lys Leu Arg Thr Gln Ile Pro Ala Glu Met Leu Ala | | | |
| 360 | 365 | 370 | |
| agc att gat ctg aaa tat ttc aat gat tca aca aaa aag aaa att gag | | | 1205 |
| Ser Ile Asp Leu Lys Tyr Phe Asn Asp Ser Thr Lys Lys Ile Glu | | | |
| 375 | 380 | 385 | 390 |

aag ata cga cca caa gcc gaa ttc
Lys Ile Arg Pro Gln Ala Glu Phe
395

<210> 63
<211> 398
<212> PRT
<213> Equine influenza virus H3N8

<400> 63

Met Asp Val Asn Pro Thr Leu Leu Phe Leu Lys Val Pro Ala Gln Asn
1 5 10 15

Ala Ile Ser Thr Thr Phe Pro Tyr Thr Gly Asp Pro Pro Tyr Ser His
20 25 30

Gly Thr Gly Thr Gly Tyr Thr Met Asp Thr Val Asn Arg Thr His Gln
35 40 45

Tyr Ser Glu Lys Gly Lys Trp Thr Thr Asn Thr Glu Ile Gly Ala Pro
50 55 60

Gln Leu Asn Pro Ile Asp Gly Pro Leu Pro Glu Asp Asn Glu Pro Ser
65 70 75 80

Gly Tyr Ala Gln Thr Asp Cys Val Leu Glu Ala Met Ala Phe Leu Glu
85 90 95

Glu Ser His Pro Gly Ile Phe Glu Asn Ser Cys Leu Glu Thr Met Glu
100 105 110

Val Val Gln Gln Thr Arg Val Asp Lys Leu Thr Gln Gly Arg Gln Thr
115 120 125

Tyr Asp Trp Thr Leu Asn Arg Asn Gln Pro Ala Ala Thr Ala Leu Ala
130 135 140

Asn Thr Ile Glu Val Phe Arg Ser Asn Asp Leu Thr Ser Ser Glu Ser
145 150 155 160

Gly Arg Leu Met Asp Phe Leu Lys Asp Val Met Glu Ser Met Asn Lys
165 170 175

Glu Glu Met Glu Ile Thr Thr His Phe Gln Arg Lys Arg Arg Val Arg
180 185 190

EQ-1-C2-1.ST25.txt

Asp Asn Met Thr Lys Arg Met Val Thr Gln Arg Thr Ile Gly Lys Lys
195 200 205

Lys Gln Arg Leu Asn Arg Lys Ser Tyr Leu Ile Arg Ala Leu Thr Leu
210 215 220

Asn Thr Met Thr Lys Asp Ala Glu Arg Gly Lys Leu Lys Arg Arg Ala
225 230 235 240

Ile Ala Thr Pro Gly Met Gln Ile Arg Gly Phe Val Tyr Phe Val Glu
245 250 255

Thr Leu Ala Arg Arg Ile Cys Glu Lys Leu Glu Gln Ser Gly Leu Pro
260 265 270

Val Gly Gly Asn Glu Lys Lys Ala Lys Leu Ala Asn Val Val Arg Lys
275 280 285

Met Met Thr Asn Ser Gln Asp Thr Glu Leu Ser Phe Thr Ile Thr Gly
290 295 300

Asp Asn Thr Lys Trp Asn Glu Asn Gln Asn Pro Arg Met Phe Leu Ala
305 310 315 320

Met Ile Thr Tyr Ile Thr Arg Asn Gln Pro Glu Trp Phe Arg Asn Val
325 330 335

Leu Ser Ile Ala Pro Ile Met Phe Ser Asn Lys Met Ala Arg Leu Gly
340 345 350

Lys Gly Tyr Met Phe Glu Ser Lys Ser Met Lys Leu Arg Thr Gln Ile
355 360 365

Pro Ala Glu Met Leu Ala Ser Ile Asp Leu Lys Tyr Phe Asn Asp Ser
370 375 380

Thr Lys Lys Lys Ile Glu Lys Ile Arg Pro Gln Ala Glu Phe
385 390 395

<210> 64
<211> 1194
<212> DNA
<213> Equine influenza virus H3N8

<400> 64

EQ-1-C2-1.ST25.txt

atggatgtca atccgactct actcttctta aaggtgccag cgcaaaaatgc tataaggcaca 60
acattccctt atactggaga tcctccctac agtcatggaa cagggacagg atacaccatg 120
gatactgtca acagaacaca tcaatactca gaaaagggga aatggacaac aaacactgag 180
attggagcac cacaacttaa tccaatcgat ggaccgcttc ctgaagacaa tgaaccaagt 240
gggtacgccc aaacagattg tgtattggaa gcaatggctt tccttgaaga atcccatccc 300
ggaatcttg aaaattcgtg tcttcaaaca atggaggtgg ttcagcagac aagagtggac 360
aaactaacac aaggccgaca aacttacgat tggaccttga ataggaatca acctgcccga 420
acagcacttg ctaatacaat tgaagtgttc agatcaaatg atctgacttc cagtgagtca 480
gggagattaa tggacttcct caaagatgtc atggagtcca tgaacaagga agaaatggaa 540
ataacaacac acttccaaacg gaagagaaga gtaagagaca acatgacaaa gagaatggtg 600
acacagagaa ccatagggaa gaaaaaacaa cgattaaaca gaaagagcta tctgatcagg 660
gcattaacct taaacacaat gaccaaggac gctgagagag ggaaattgaa acgacgagca 720
attgcaaccc caggaatgca gataagaggg ttgttatatt ttgttcaaac attagcccgaa 780
agaatatgtg aaaagcttga acaatcagga ttgccagttg gcggtaatga gaaaaaggcc 840
aaactggcta atgtcgtag aaaaatgtg actaattccc aagacactga actctcccttc 900
accatcactg gggacaatac caaatggaaat gaaaatcaga acccacgcat gttcctggca 960
atgatcacat acataactag aaaccagcca gaatggttca gaaatgttct aagcattgca 1020
ccgattatgt tctcaaataa aatggcaaga ctggggaaag gatatatgtt tgaaagcaaa 1080
agtatgaaat tgagaactca aataccagca gaaatgctcg caagcattga tctgaaatata 1140
ttcaatgtattt caacaaaaaaaaaaaaatttgag aagatacgcac cacaagccgaa attc 1194

<210> 65
<211> 673
<212> DNA
<213> Equine influenza virus H3N8

<220>
<221> CDS
<222> (36)..(671)
<223>

<400> 65
gaattcggct tagcaaaagc aggcaaacta tttga atg gat gtc aat ccg act 53
Met Asp Val Asn Pro Thr
1 5

EQ-1-C2-1.ST25.txt

10

15

20

| | |
|---|-----|
| cct tat act gga gat cct ccc tac agt cat gga aca ggg aca gga tac Pro Tyr Thr Gly Asp Pro Pro Tyr Ser His Gly Thr Gly Thr Gly Tyr 25 30 35 | 149 |
| acc atg gat act gtc aac aga aca cat caa tac tca gaa aag ggg aaa Thr Met Asp Thr Val Asn Arg Thr His Gln Tyr Ser Glu Lys Gly Lys 40 45 50 | 197 |
| tgg aca aca aac act gag att gga gca cca caa ctt aat cca atc gat Trp Thr Thr Asn Thr Glu Ile Gly Ala Pro Gln Leu Asn Pro Ile Asp 55 60 65 70 | 245 |
| gga ccg ctt cct gaa gac aat gaa cca agt ggg tac gcc caa aca gat Gly Pro Leu Pro Glu Asp Asn Glu Pro Ser Gly Tyr Ala Gln Thr Asp 75 80 85 | 293 |
| tgt gta ttg gaa gca atg gct ttc ctt gaa gaa tcc cat ccc gga atc Cys Val Leu Glu Ala Met Ala Phe Leu Glu Glu Ser His Pro Gly Ile 90 95 100 | 341 |
| ttt gaa aat tcg tgt ctt gaa aca atg gag gtg gtt cag cag aca aga Phe Glu Asn Ser Cys Leu Glu Thr Met Glu Val Val Gln Gln Thr Arg 105 110 115 | 389 |
| gtg gac aaa cta aca caa ggc cga caa act tac gat tgg acc ttg aat Val Asp Lys Leu Thr Gln Gly Arg Gln Thr Tyr Asp Trp Thr Leu Asn 120 125 130 | 437 |
| agg aat caa cct gcc gca aca gca ctt gct aat aca att gaa gtg ttc Arg Asn Gln Pro Ala Ala Thr Ala Leu Ala Asn Thr Ile Glu Val Phe 135 140 145 150 | 485 |
| aga tca aat gat ctg act tcc agt gag tca ggg aga tta atg gac ttc Arg Ser Asn Asp Leu Thr Ser Ser Glu Ser Gly Arg Leu Met Asp Phe 155 160 165 | 533 |
| ctc aaa gat gtc atg gag tcc atg aac aag gaa atg gaa ata aca Leu Lys Asp Val Met Glu Ser Met Asn Lys Glu Glu Met Glu Ile Thr 170 175 180 | 581 |
| aca cac ttc caa cgg aag aga aga gta aga gac aac atg aca aag aga Thr His Phe Gln Arg Lys Arg Arg Val Arg Asp Asn Met Thr Lys Arg 185 190 195 | 629 |
| atg gtg aca cag aga acc ata ggg aag aaa aaa caa cga tta aa Met Val Thr Gln Arg Thr Ile Gly Lys Lys Gln Arg Leu 200 205 210 | 673 |

<210> 66
<211> 212
<212> PRT
<213> Equine influenza virus H3N8

<400> 66

Met Asp Val Asn Pro Thr Leu Leu Phe Leu Lys Val Pro Ala Gln Asn

EQ-1-C2-1.ST25.txt

1

5

10

15

Ala Ile Ser Thr Thr Phe Pro Tyr Thr Gly Asp Pro Pro Tyr Ser His
20 25 30

Gly Thr Gly Thr Gly Tyr Thr Met Asp Thr Val Asn Arg Thr His Gln
35 40 45

Tyr Ser Glu Lys Gly Lys Trp Thr Thr Asn Thr Glu Ile Gly Ala Pro
50 55 60

Gln Leu Asn Pro Ile Asp Gly Pro Leu Pro Glu Asn Glu Pro Ser
65 70 75 80

Gly Tyr Ala Gln Thr Asp Cys Val Leu Glu Ala Met Ala Phe Leu Glu
85 90 95

Glu Ser His Pro Gly Ile Phe Glu Asn Ser Cys Leu Glu Thr Met Glu
100 105 110

Val Val Gln Gln Thr Arg Val Asp Lys Leu Thr Gln Gly Arg Gln Thr
115 120 125

Tyr Asp Trp Thr Leu Asn Arg Asn Gln Pro Ala Ala Thr Ala Leu Ala
130 135 140

Asn Thr Ile Glu Val Phe Arg Ser Asn Asp Leu Thr Ser Ser Glu Ser
145 150 155 160

Gly Arg Leu Met Asp Phe Leu Lys Asp Val Met Glu Ser Met Asn Lys
165 170 175

Glu Glu Met Glu Ile Thr Thr His Phe Gln Arg Lys Arg Arg Val Arg
180 185 190

Asp Asn Met Thr Lys Arg Met Val Thr Gln Arg Thr Ile Gly Lys Lys
195 200 205

Lys Gln Arg Leu
210

<210> 67
<211> 636
<212> DNA
<213> Equine influenza virus H3N8

EQ-1-C2-1.ST25.txt

| | | |
|--|----|-----|
| <400> | 67 | |
| atggatgtca atccgactct acttttctta aaggtgccag cgcaaaatgc tataaggcaca | | 60 |
| acattccctt atactggaga tcctccctac agtcatggaa cagggacagg atacaccatg | | 120 |
| gatactgtca acagaacaca tcaatactca gaaaagggga aatggacaaac aaacactgag | | 180 |
| attggagcac cacaacttaa tccaatcgat ggaccgcttc ctgaagacaa tgaaccaagt | | 240 |
| gggtacgccc aaacagattg tgtattggaa gcaatggctt tccttgaaga atcccatccc | | 300 |
| ggaatcttg aaaattcgtg tcttgaaca atggaggtgg ttcagcagac aagagtggac | | 360 |
| aaactaacac aaggccgaca aacttacgat tggaccttga ataggaatca acctgccgca | | 420 |
| acagcacttg ctaatacaat tgaagtgttc agatcaaatg atctgacttc cagtgagtca | | 480 |
| gggagattaa tggacttcct caaagatgtc atggagtcca tgaacaagga agaaatggaa | | 540 |
| ataacaacac acttccaacg gaagagaaga gtaagagaca acatgacaaa gagaatggtg | | 600 |
| acacagagaa ccatagggaa gaaaaaacaacgattta | | 636 |

<210> 68
 <211> 1225
 <212> DNA
 <213> Equine influenza virus H3N8

 <220>
 <221> CDS
 <222> (34) .. (1218)
 <223>

| | | |
|---|----|-----|
| <400> | 68 | |
| gaattcagga gcaaaagcag gcaaactatt tga atg gat gtc aat ccg act cta | | 54 |
| Met Asp Val Asn Pro Thr Leu | | |
| 1 | 5 | |
| ctc ttc tta aag gtg cca gcg caa aat gct ata agc aca aca ttc cct | | 102 |
| Leu Phe Leu Lys Val Pro Ala Gln Asn Ala Ile Ser Thr Thr Phe Pro | | |
| 10 | 15 | 20 |
| tat act gga gat cct ccc tac agt cat gga aca gca ggg aca gga tac acc | | 150 |
| Tyr Thr Gly Asp Pro Pro Tyr Ser His Gly Thr Gly Thr Gly Tyr Thr | | |
| 25 | 30 | 35 |
| atg gat act gtc aac aga aca cat caa tac tca gaa aag ggg aaa tgg | | 198 |
| Met Asp Thr Val Asn Arg Thr His Gln Tyr Ser Glu Lys Gly Lys Trp | | |
| 40 | 45 | 55 |
| aca aca aac act gag att gga gca cca caa ctt aat cca atc gat gga | | 246 |
| Thr Thr Asn Thr Glu Ile Gly Ala Pro Gln Leu Asn Pro Ile Asp Gly | | |
| 60 | 65 | 70 |
| ccg ctt cct gaa gac aat gaa cca agt ggg tac gcc caa aca gat tgt | | 294 |
| Pro Leu Pro Glu Asp Asn Glu Pro Ser Gly Tyr Ala Gln Thr Asp Cys | | |

EQ-1-C2-1.ST25.txt

75

80

85

| | |
|--|------|
| gta ttg gaa gca atg gct ttc ctt gaa gaa tcc cat ccc gga atc ttt Val Leu Glu Ala Met Ala Phe Leu Glu Glu Ser His Pro Gly Ile Phe | 342 |
| 90 95 100 | |
| gaa aat tcg tgt ctt gaa aca atg gag gtg gtt cag cag aca aca aga gtg Glu Asn Ser Cys Leu Glu Thr Met Glu Val Val Gln Gln Thr Arg Val | 390 |
| 105 110 115 | |
| gac aaa cta aca caa ggc cga caa act tac gat tgg acc ttg aat agg Asp Lys Leu Thr Gln Gly Arg Gln Thr Tyr Asp Trp Thr Leu Asn Arg | 438 |
| 120 125 130 135 | |
| aat caa cct gcc gca aca gca ctt gct aat aca att gaa gtg ttc aga Asn Gln Pro Ala Ala Thr Ala Leu Ala Asn Thr Ile Glu Val Phe Arg | 486 |
| 140 145 150 | |
| tca aat gat ctg act tcc agt gag tca ggg aga tta atg gac ttc ctc Ser Asn Asp Leu Thr Ser Ser Glu Ser Gly Arg Leu Met Asp Phe Leu | 534 |
| 155 160 165 | |
| aaa gat gtc atg gag tcc atg aac aag gaa gaa atg gaa ata aca aca Lys Asp Val Met Glu Ser Met Asn Lys Glu Glu Met Glu Ile Thr Thr | 582 |
| 170 175 180 | |
| cac ttc caa cgg aag aga aga gta aga gac aac atg aca aag aga atg His Phe Gln Arg Lys Arg Arg Val Arg Asp Asn Met Thr Lys Arg Met | 630 |
| 185 190 195 | |
| gtg aca cag aga acc ata ggg aag aaa aaa caa cga tta aac aga aag Val Thr Gln Arg Thr Ile Gly Lys Lys Gln Arg Leu Asn Arg Lys | 678 |
| 200 205 210 215 | |
| agc tat ctg atc agg gca tta acc tta aac aca atg acc aag gac gct Ser Tyr Leu Ile Arg Ala Leu Thr Leu Asn Thr Met Thr Lys Asp Ala | 726 |
| 220 225 230 | |
| gag aga ggg aaa ttg aaa cga cga gca att gca acc cca gga atg cag Glu Arg Gly Lys Leu Lys Arg Arg Ala Ile Ala Thr Pro Gly Met Gln | 774 |
| 235 240 245 | |
| ata aga ggg ttt gta tat ttt gtt gaa aca tta gcc cga aga ata tgt Ile. Arg Gly Phe Val Tyr Phe Val Glu Thr Leu Ala Arg Arg Ile Cys | 822 |
| 250 255 260 | |
| gaa aag ctt gaa caa tca gga ttg cca gtt ggc ggt aat gag aaa aag Glu Lys Leu Glu Gln Ser Gly Leu Pro Val Gly Gly Asn Glu Lys Lys | 870 |
| 265 270 275 | |
| gcc aaa ctg gct aat gtc gtc aga aaa atg atg act aat tcc caa gac Ala Lys Leu Ala Asn Val Val Arg Lys Met Met Thr Asn Ser Gln Asp | 918 |
| 280 285 290 295 | |
| act gaa ctc tcc ttc acc atc act ggg gac aat acc aaa tgg aat gaa Thr Glu Leu Ser Phe Thr Ile Thr Gly Asp Asn Thr Lys Trp Asn Glu | 966 |
| 300 305 310 | |
| aat cag aac cca cgc atg ttc ctg gca atg atc aca tac ata act aga | 1014 |

EQ-1-C2-1.ST25.txt

| | | | |
|---|-----|-----|------|
| Asn Gln Asn Pro Arg Met Phe Leu Ala Met Ile Thr Tyr Ile Thr Arg | | | |
| 315 | 320 | 325 | |
| aac cag cca gaa tgg ttc aga aat gtt cta agc att gca ccg att atg | | | 1062 |
| Asn Gln Pro Glu Trp Phe Arg Asn Val Leu Ser Ile Ala Pro Ile Met | | | |
| 330 | 335 | 340 | |
| tgc tca aat aaa atg gca aga ctg ggg aaa gga tat atg ttt gaa agc | | | 1110 |
| Phe Ser Asn Lys Met Ala Arg Leu Gly Lys Gly Tyr Met Phe Glu Ser | | | |
| 345 | 350 | 355 | |
| aaa agt atg aaa ttg aga act caa ata cca gca gaa atg ctc gca agc | | | 1158 |
| Lys Ser Met Lys Leu Arg Thr Gln Ile Pro Ala Glu Met Leu Ala Ser | | | |
| 360 | 365 | 370 | 375 |
| att gat ctg aaa tat ttc aat gat tca aca aaa aag aaa att gag aag | | | 1206 |
| Ile Asp Leu Lys Tyr Phe Asn Asp Ser Thr Lys Lys Ile Glu Lys | | | |
| 380 | 385 | 390 | |
| ata cga cca ccc tgaattc | | | 1225 |
| Ile Arg Pro Pro | | | |
| 395 | | | |
| | | | |
| <210> 69 | | | |
| <211> 395 | | | |
| <212> PRT | | | |
| <213> Equine influenza virus H3N8 | | | |
| | | | |
| <400> 69 | | | |
| | | | |
| Met Asp Val Asn Pro Thr Leu Leu Phe Leu Lys Val Pro Ala Gln Asn | | | |
| 1 | 5 | 10 | 15 |
| | | | |
| Ala Ile Ser Thr Thr Phe Pro Tyr Thr Gly Asp Pro Pro Tyr Ser His | | | |
| 20 | 25 | 30 | |
| | | | |
| Gly Thr Gly Thr Gly Tyr Thr Met Asp Thr Val Asn Arg Thr His Gln | | | |
| 35 | 40 | 45 | |
| | | | |
| Tyr Ser Glu Lys Gly Lys Trp Thr Thr Asn Thr Glu Ile Gly Ala Pro | | | |
| 50 | 55 | 60 | |
| | | | |
| Gln Leu Asn Pro Ile Asp Gly Pro Leu Pro Glu Asp Asn Glu Pro Ser | | | |
| 65 | 70 | 75 | 80 |
| | | | |
| Gly Tyr Ala Gln Thr Asp Cys Val Leu Glu Ala Met Ala Phe Leu Glu | | | |
| 85 | 90 | 95 | |
| | | | |
| Glu Ser His Pro Gly Ile Phe Glu Asn Ser Cys Leu Glu Thr Met Glu | | | |
| 100 | 105 | 110 | |

EQ-1-C2-1.ST25.txt

Val Val Gln Gln Thr Arg Val Asp Lys Leu Thr Gln Gly Arg Gln Thr
115 120 125

Tyr Asp Trp Thr Leu Asn Arg Asn Gln Pro Ala Ala Thr Ala Leu Ala
130 135 140

Asn Thr Ile Glu Val Phe Arg Ser Asn Asp Leu Thr Ser Ser Glu Ser
145 150 155 160

Gly Arg Leu Met Asp Phe Leu Lys Asp Val Met Glu Ser Met Asn Lys
165 170 175

Glu Glu Met Glu Ile Thr Thr His Phe Gln Arg Lys Arg Arg Val Arg
180 185 190

Asp Asn Met Thr Lys Arg Met Val Thr Gln Arg Thr Ile Gly Lys Lys
195 200 205

Lys Gln Arg Leu Asn Arg Lys Ser Tyr Leu Ile Arg Ala Leu Thr Leu
210 215 220

Asn Thr Met Thr Lys Asp Ala Glu Arg Gly Lys Leu Lys Arg Arg Ala
225 230 235 240

Ile Ala Thr Pro Gly Met Gln Ile Arg Gly Phe Val Tyr Phe Val Glu
245 250 255

Thr Leu Ala Arg Arg Ile Cys Glu Lys Leu Glu Gln Ser Gly Leu Pro
260 265 270

Val Gly Asn Glu Lys Lys Ala Lys Leu Ala Asn Val Val Arg Lys
275 280 285

Met Met Thr Asn Ser Gln Asp Thr Glu Leu Ser Phe Thr Ile Thr Gly
290 295 300 320

Asp Asn Thr Lys Trp Asn Glu Asn Gln Asn Pro Arg Met Phe Leu Ala
305 310 315 320

Met Ile Thr Tyr Ile Thr Arg Asn Gln Pro Glu Trp Phe Arg Asn Val
325 330 335

Leu Ser Ile Ala Pro Ile Met Phe Ser Asn Lys Met Ala Arg Leu Gly
340 345 350

EQ-1-C2-1.ST25.txt

Lys Gly Tyr Met Phe Glu Ser Lys Ser Met Lys Leu Arg Thr Gln Ile
 355 360 365

Pro Ala Glu Met Leu Ala Ser Ile Asp Leu Lys Tyr Phe Asn Asp Ser
 370 375 380

Thr Lys Lys Lys Ile Glu Lys Ile Arg Pro Pro
 385 390 395

<210> 70
 <211> 1185
 <212> DNA
 <213> Equine influenza virus H3N8

| | | |
|--|------|--|
| <400> 70 | | |
| atggatgtca atccgactct actttctta aaggtgccag cgcaaaatgc tataaggcaca | 60 | |
| acattccctt atactggaga tcctccctac agtcatggaa cagggacagg atacaccatg | 120 | |
| gatactgtca acagaacaca tcaatactca gaaaagggga aatggacaac aaacactgag | 180 | |
| attggagcac cacaacttaa tccaatcgat ggaccgcttc ctgaagacaa tgaaccaagt | 240 | |
| gggtacgccc aaacagattg tgtattggaa gcaatggctt tccttgaaga atcccatccc | 300 | |
| ggaatcttg aaaattcgtg tcttcaaaca atggaggtgg tttagcagac aagagtggac | 360 | |
| aaactaacac aaggccgaca aacttacgat tggaccccttga ataggaatca acctgcccga | 420 | |
| acagcacttg ctaatacaat tgaagtgttc agatcaaatg atctgacttc cagtgagtca | 480 | |
| gggagattaa tggacttcct caaagatgtc atggagtcca tgaacaagga agaaatggaa | 540 | |
| ataacaacac acttccaacg gaagagaaga gtaagagaca acatgacaaa gagaatggtg | 600 | |
| acacagagaa ccatagggaa gaaaaaaca cgattaaaca gaaagagcta tctgatcagg | 660 | |
| gcattaacct taaacacaat gaccaaggac gctgagagag gggaaattgaa acgacgagca | 720 | |
| attgcaaccc caggaatgca gataagaggg tttgttatatt ttgttggaaac attagccccga | 780 | |
| agaatatgtg aaaagcttga acaatcagga ttgccagttg gcggtaatga gaaaaaggcc | 840 | |
| aaactggcta atgtcgtag aaaaatgtatg actaattccc aagacactga acttccttc | 900 | |
| accatcactg gggacaatac caaatggaaat gaaaatcaga acccacgcat gttccctggca | 960 | |
| atgatcacat acataactag aaaccagcca gaatggttca gaaatgttct aagcattgca | 1020 | |
| ccgattatgt tctcaaataa aatggcaaga ctggggaaag gatatatgtt tgaaagcaaa | 1080 | |
| agtatgaaat tgagaactca aataccagca gaaatgctcg caagcattga tctgaaatat | 1140 | |
| ttcaatgatt caacaaaaaa gaaaattgag aagatacgac caccc | 1185 | |

EQ-1-C2-1.ST25.txt

<210> 71

<211> 1221

<212> DNA

<213> Equine influenza virus H3N8

<400> 71
gaattcaggaa aagcaggcaa actatggaa tggatgtcaa tccgactcta ctcttcttaa 60
agggccagc gcaaaaatgct ataagcacaa cattccctta tactggagat cctccctaca 120
gtcatggaac agggacagga tacaccatgg atactgtcaa cagaacacat caataactcag 180
aaaaggggaa atggacaaca aacactgaga ttggagcacc acaacttaat ccaatcgatg 240
gaccgcttcc tgaagacaat gaaccaagtg ggtacgccc aacagattgt gtattggaag 300
caatggcttt ccttgaagaa tcccatcccg gaatcttga aaattcgtgt cttgaaacaa 360
tggaggtggt tcagcagaca agagtggaca aactaacaca aggccgacaa acttacgatt 420
ggaccttgaa taggaatcaa cctgcccggaa cagcacttgc taataacaatt gaagtgttca 480
gatcaaatga tctgacttcc agtgagtcag ggagattaat ggacttcctc aaagatgtca 540
tggagtccat gaacaaggaa gaaatggaaa taacaacaca cttccaacgg aagagaagag 600
taagagacaa catgacaaag agaatggtga cacagagaac catagggaaag aaaaaacaac 660
gattaaacag aaagagctat ctgatcaggg cattaacctt aaacacaatg accaaggacg 720
ctgagagagg gaaattgaaa cgacgagcaa ttgcaacccc aggaatgcag ataagagggt 780
ttgtatattt tggtgaaaca ttagccgaa gaatatgtga aaagcttcaa caatcaggat 840
tgccagttgg cggtaatgag aaaaaggcca aactggctaa tgtcgtcaga aaaatgtga 900
ctaattccca agacactgaa ctctccttca ccatcactgg ggacaatacc aaatggaatg 960
aaaatcagaa cccacgcattg ttccctggcaa tgatcacata cataactaga aaccagccag 1020
aatggttcag aaatgttcta agcattgcac cgattatgtt ctcaaataaa atggcaagac 1080
tggggaaagg atatatgttt gaaagcaaaa gtatgaaatt gagaactcaa ataccagcag 1140
aaatgctcgc aagcattgat ctgaaatatt tcaatgattc aacaaaaaaag aaaattgaga 1200
agatacgcacc accctgaatt c 1221

<210> 72

<211> 18

<212> DNA

<213> Artificial sequence

<220>

<223> Synthetic Primer

<400> 72

EQ-1-C2-1.ST25.txt

gcaaatgcag gaccaaag

18

<210> 73
<211> 18
<212> DNA
<213> Artificial sequence

<220>
<223> Synthetic Primer

<400> 73
gactgaggac tcagcttc

18

<210> 74
<211> 19
<212> DNA
<213> Artificial sequence

<220>
<223> Synthetic Primer

<400> 74
caa~~t~~atcctc cccaaattc

19

<210> 75
<211> 19
<212> DNA
<213> Artificial sequence

<220>
<223> Synthetic Primer

<400> 75
ggaaggtttg caggacctt

19

<210> 76
<211> 1228
<212> DNA
<213> Equine influenza virus H3N8

<220>
<221> CDS
<222> (3)...(1166)
<223>

<400> 76
gg ggc ggg tac cca aac tat ctc caa gct tgg aag caa gta tta gca
Gly Gly Tyr Pro Asn Tyr Leu Gln Ala Trp Lys Gln Val Leu Ala
1 5 10 15

47

gaa cta caa gac ctt gag aac gaa gaa aag acc cct aag acc aag aat
Glu Leu Gln Asp Leu Glu Asn Glu Glu Lys Thr Pro Lys Thr Lys Asn
20 25 30

95

EQ-1-C2-1.ST25.txt

| | |
|---|-----|
| atg aaa aaa aca agc caa ttg aaa tgg gca ctc ggt gaa aat atg gca Met Lys Lys Thr Ser Gln Leu Lys Trp Ala Leu Gly Glu Asn Met Ala 35 40 45 | 143 |
| cca gag aaa gtg gat ttt gag gat tgt aaa gac atc aat gat ttg aaa Pro Glu Lys Val Asp Phe Glu Asp Cys Lys Asp Ile Asn Asp Leu Lys 50 55 60 | 191 |
| cag tat gac agt gat gag cca gaa aca agg tct ctt gca agt tgg att Gln Tyr Asp Ser Asp Glu Pro Glu Thr Arg Ser Leu Ala Ser Trp Ile 65 70 75 | 239 |
| caa agt gag ttc aac aaa gct tgt gag ctg aca gat tca agc tgg ata Gln Ser Glu Phe Asn Lys Ala Cys Glu Leu Thr Asp Ser Ser Trp Ile 80 85 90 95 | 287 |
| gag ctc gat gaa att ggg gag gat att gcc cca ata gaa tac att gcg Glu Leu Asp Glu Ile Gly Glu Asp Ile Ala Pro Ile Glu Tyr Ile Ala 100 105 110 | 335 |
| agc atg agg aga aat tat ttt act gct gag gtt tcc cat tgt aga gca Ser Met Arg Arg Asn Tyr Phe Thr Ala Glu Val Ser His Cys Arg Ala 115 120 125 | 383 |
| aca gaa tat ata atg aag gga gtg tac atc aac act gct cta ctc aat Thr Glu Tyr Ile Met Lys Gly Val Tyr Ile Asn Thr Ala Leu Leu Asn 130 135 140 | 431 |
| gca tcc tgt gct gcg atg gat gaa ttc caa tta att ccg atg ata agc Ala Ser Cys Ala Ala Met Asp Glu Phe Gln Leu Ile Pro Met Ile Ser 145 150 155 | 479 |
| aaa tgc agg acc aaa gaa ggg aga agg aag aca aat tta tat gga ttc Lys Cys Arg Thr Lys Glu Gly Arg Arg Lys Thr Asn Leu Tyr Gly Phe 160 165 170 175 | 527 |
| ata.ata aag gga agg tcc cat tta agg aat gat acc gac gtg gta aac Ile Ile Lys Gly Arg Ser His Leu Arg Asn Asp Thr Asp Val Val Asn 180 185 190 | 575 |
| ttt gta agt atg gaa ttt tct ctc act gat cca aga ttt gag cca cat Phe Val Ser Met Glu Phe Ser Leu Thr Asp Pro Arg Phe Glu Pro His 195 200 205 | 623 |
| aaa tgg gaa aaa tac tgc gtt cta gaa att gga gac atg ctc cta agg Lys Trp Glu Lys Tyr Cys Val Leu Glu Ile Gly Asp Met Leu Leu Arg 210 215 220 | 671 |
| act gct gta ggt caa gtg tca aga ccc atg ttt ttg tat gta agg aca Thr Ala Val Gly Gln Val Ser Arg Pro Met Phe Leu Tyr Val Arg Thr 225 230 235 | 719 |
| aat gga acc tct aaa att aaa atg aaa cgg gga atg gaa atg aga cgc Asn Gly Thr Ser Lys Ile Lys Met Lys Arg Gly Met Glu Met Arg Arg 240 245 250 255 | 767 |
| tgc ctc ctt cag tct ctg caa cag att gaa agc atg atc gaa gct gag Cys Leu Leu Gln Ser Leu Gln Gln Ile Glu Ser Met Ile Glu Ala Glu 260 265 270 | 815 |

EQ-1-C2-1.ST25.txt

| | |
|---|------|
| tcc tca gtc aaa gaa aag gac atg acc aaa gaa ttc ttt gag aac aaa Ser Ser Val Lys Glu Lys Asp Met Thr Lys Glu Phe Phe Glu Asn Lys 275 280 285 | 863 |
| tca gag aca tgg cct ata gga gag tcc ccc aaa gga gtg gaa gag ggc Ser Glu Thr Trp Pro Ile Gly Glu Ser Pro Lys Gly Val Glu Glu Gly 290 295 300 | 911 |
| tca atc ggg aag gtt tgc agg acc tta tta gca aaa tct gtg ttt aac Ser Ile Gly Lys Val Cys Arg Thr Leu Leu Ala Lys Ser Val Phe Asn 305 310 315 | 959 |
| agt ttg tat gca tct cca caa ctg gaa ggg ttt tca gct gaa tct agg Ser Leu Tyr Ala Ser Pro Gln Leu Glu Gly Phe Ser Ala Glu Ser Arg 320 325 330 335 | 1007 |
| aaa tta ctt ctc att gtt cag gcc ctt agg gat aac ctg gaa cct gga Lys Leu Leu Ile Val Gln Ala Leu Arg Asp Asn Leu Glu Pro Gly 340 345 350 | 1055 |
| acc ttt gat att ggg ggg tta tat gaa tca att gag gag tgc ctg att Thr Phe Asp Ile Gly Gly Leu Tyr Glu Ser Ile Glu Glu Cys Leu Ile 355 360 365 | 1103 |
| aat gat ccc tgg gtt ttg ctc aat gca tct tgg ttc aac tcc ttc ctt Asn Asp Pro Trp Val Leu Leu Asn Ala Ser Trp Phe Asn Ser Phe Leu 370 375 380 | 1151 |
| aca cat gca ctg aag tagttgtgc aatgctacta tttgctatcc atactgtcca Thr His Ala Leu Lys 385 | 1206 |
| aaaaagtact cgagccccca ag | 1228 |

<210> 77
<211> 388
<212> PRT
<213> Equine influenza virus H3N8

<400> 77

Gly Gly Tyr Pro Asn Tyr Leu Gln Ala Trp Lys Gln Val Leu Ala Glu
1 5 10 15

Leu Gln Asp Leu Glu Asn Glu Glu Lys Thr Pro Lys Thr Lys Asn Met
20 25 30

Lys Lys Thr Ser Gln Leu Lys Trp Ala Leu Gly Glu Asn Met Ala Pro
35 40 45

Glu Lys Val Asp Phe Glu Asp Cys Lys Asp Ile Asn Asp Leu Lys Gln
50 55 60

EQ-1-C2-1.ST25.txt

Tyr Asp Ser Asp Glu Pro Glu Thr Arg Ser Leu Ala Ser Trp Ile Gln
65 70 75 80

Ser Glu Phe Asn Lys Ala Cys Glu Leu Thr Asp Ser Ser Trp Ile Glu
85 90 95

Leu Asp Glu Ile Gly Glu Asp Ile Ala Pro Ile Glu Tyr Ile Ala Ser
100 105 110

Met Arg Arg Asn Tyr Phe Thr Ala Glu Val Ser His Cys Arg Ala Thr
115 120 125

Glu Tyr Ile Met Lys Gly Val Tyr Ile Asn Thr Ala Leu Leu Asn Ala
130 135 140

Ser Cys Ala Ala Met Asp Glu Phe Gln Leu Ile Pro Met Ile Ser Lys
145 150 155 160

Cys Arg Thr Lys Glu Gly Arg Arg Lys Thr Asn Leu Tyr Gly Phe Ile
165 170 175

Ile Lys Gly Arg Ser His Leu Arg Asn Asp Thr Asp Val Val Asn Phe
180 185 190

Val Ser Met Glu Phe Ser Leu Thr Asp Pro Arg Phe Glu Pro His Lys
195 200 205

Trp Glu Lys Tyr Cys Val Leu Glu Ile Gly Asp Met Leu Leu Arg Thr
210 215 220

Ala Val Gly Gln Val Ser Arg Pro Met Phe Leu Tyr Val Arg Thr Asn
225 230 235 240

Gly Thr Ser Lys Ile Lys Met Lys Arg Gly Met Glu Met Arg Arg Cys
245 250 255

Leu Leu Gln Ser Leu Gln Gln Ile Glu Ser Met Ile Glu Ala Glu Ser
260 265 270

Ser Val Lys Glu Lys Asp Met Thr Lys Glu Phe Phe Glu Asn Lys Ser
275 280 285

Glu Thr Trp Pro Ile Gly Glu Ser Pro Lys Gly Val Glu Glu Gly Ser
290 295 300

EQ-1-C2-1.ST25.txt

Ile Gly Lys Val Cys Arg Thr Leu Leu Ala Lys Ser Val Phe Asn Ser
305 310 315 320

Leu Tyr Ala Ser Pro Gln Leu Glu Gly Phe Ser Ala Glu Ser Arg Lys
325 330 335

Leu Leu Leu Ile Val Gln Ala Leu Arg Asp Asn Leu Glu Pro Gly Thr
340 345 350

Phe Asp Ile Gly Gly Leu Tyr Glu Ser Ile Glu Glu Cys Leu Ile Asn
355 360 365

Asp Pro Trp Val Leu Leu Asn Ala Ser Trp Phe Asn Ser Phe Leu Thr
370 375 380

His Ala Leu Lys
385

<210> 78
<211> 1164
<212> DNA
<213> Equine influenza virus H3N8

| | |
|---|-----|
| <400> 78 | 60 |
| ggcggttacc caaactatct ccaagcttgg aagcaagtat tagcagaact acaagacatt | 60 |
| gagaacgaag aaaagacccc taagaccaag aatatgaaaa aaacaagcca attgaaatgg | 120 |
| gcactcggtg aaaatatggc accagagaaa gtggattttg aggattgtaa agacatcaat | 180 |
| gattgaaac agtatgacag ttagtggccca gaaacaagggt ctcttgcaag ttggattcaa | 240 |
| agttagttca acaaagcttgc tgtagctgaca gattcaagct ggatagagct cgatgaaatt | 300 |
| ggggaggata ttgccccat agaatacatt gcgagcatga ggagaaattha ttttactgct | 360 |
| gaggtttccc attgttaggc aacagaatat ataatgaagg gagttgtacat caacactgct | 420 |
| ctactcaatg catcctgtgc tgcgatggat gaattccat taattccgat gataagcaaa | 480 |
| tgcaggacca aagaagggag aaggaagaca aatttatatg gattcataat aaagggaaagg | 540 |
| tcccattaa ggaatgatac cgacgtggta aactttgtaa gtatggatt ttctctcact | 600 |
| gatccaagat ttgagccaca taaatggaa aaatactgcg ttctagaaat tggagacatg | 660 |
| ctcctaagga ctgctgttagg tcaagtgtca agaccatgt ttttgtatgt aaggacaaat | 720 |
| ggaacctcta aaattaaaat gaaacgggaa atggaaatga gacgctgcct ctttcagtct | 780 |
| ctgcaacaga ttgaaagcat gatcgaagct gagtcctcag tcaaagaaaa ggacatgacc | 840 |

EQ-1-C2-1.ST25.txt

| | |
|--|------|
| aaagaattct ttgagaacaa atcagagaca tggcctatacg gagagtcccc caaaggagtg | 900 |
| gaagagggct caatcggaa ggttgcagg accttattag caaatctgt gtttaacagt | 960 |
| ttgtatgcat ctccacaact ggaagggttt tcagctgaat ctagaaatt acttcatt | 1020 |
| gttcaggccc ttagggataa cctggAACCT ggaacctttg atattggggg gttatatgaa | 1080 |
| tcaattgagg agtgcctgat taatgatccc tgggtttgc tcaatgcac tttggcaac | 1140 |
| tccttcctta cacatgcact gaag | 1164 |

<210> 79
<211> 1223
<212> DNA
<213> Equine influenza virus H3N8

| | |
|---|------|
| <400> 79 ggggcgggta cccaaactat ctccaagctt ggaagcaagt attagcagaa ctacaagacc | 60 |
| ttgagaacga agaaaagacc cctaagacca agaatatgaa aaaaacaagc caattgaaat | 120 |
| gggcactcgg tgaaaatatg gcaccagaga aagtggattt tgaggattgt aaagacatca | 180 |
| atgattgaa acagtatgac agtgcgtgac cagaaacaag gtctcttgc agttggattc | 240 |
| aaagtgagtt caacaaagct tgtgagctga cagattcaag ctggatagag ctcgatgaaa | 300 |
| ttggggagga tattgccccca atagaataca ttgcgagcat gaggagaaat tattttactg | 360 |
| ctgaggtttc ccattgtaga gcaacagaat atataatgaa gggagtgtac atcaacactg | 420 |
| ctctactcaa tgcattctgt gctgcgtgg atgaattcca attaattccg atgataagca | 480 |
| aatgcaggac caaagaaggg agaaggaaga caaatttata tggattcata ataaaggaa | 540 |
| ggtcccattt aaggaatgat accgacgtgg taaaactttgt aagtatggaa ttttctctca | 600 |
| ctgatccaag atttgagcca cataaatggg aaaaatactg cgttctagaa attggagaca | 660 |
| tgctcctaag gactgctgta ggtcaagtgt caagacccat gttttgtat gtaaggacaa | 720 |
| atggaacctc taaaattaaa atgaaatggg gaatggaaat gagacgctgc ctccttcagt | 780 |
| ctctgcaaca gattgaaagc atgatcgaag ctgagtcctc agtcaaagaa aaggacatga | 840 |
| ccaaagaatt ctggagaac aaatcagaga catggctat aggagagtcc cccaaaggag | 900 |
| tggaaagaggg ctcaatcggg aagggtttgc ggaccttatt agcaaaatct gtgttaaca | 960 |
| gtttgtatgc atctccacaa ctggaaagggt tttcagctga atcttaggaaa ttacttctca | 1020 |
| ttgttcagggc ctttagggat aacctggaaac ctggAACCT tgatattggg gggtttatatg | 1080 |
| aatcaattga ggagtgcctg attaatgatc cctgggtttt gctcaatgca tcttggcaac | 1140 |
| acttccttcct tacacatgca ctgaagtagt tgttagcaatg ctactattg ctatccatac | 1200 |

EQ-1-C2-1.ST25.txt

tgtccaaaaaa agtactcgag ccc

1223

<210> 80
<211> 1233
<212> DNA
<213> Equine influenza virus H3N8

<220>
<221> CDS
<222> (3)..(1172)
<223>

<400> 80
 at gaa aag ggt ata aac cca aac tat ctc caa gct tgg aag caa gta 47
 Glu Lys Gly Ile Asn Pro Asn Tyr Leu Gln Ala Trp Lys Gln Val
 1 5 10 15

 tta gca gaa cta caa gac ctt gag aac gaa gaa aag acc cct aag acc 95
 Leu Ala Glu Leu Gln Asp Leu Glu Asn Glu Glu Lys Thr Pro Lys Thr
 20 25 30

 aag aat atg aaa aaa aca agc caa ttg aaa tgg gca ctc ggt gaa aat 143
 Lys Asn Met Lys Lys Thr Ser Gln Leu Lys Trp Ala Leu Gly Glu Asn
 35 40 45

 atg gca cca gag aaa gtg gat ttt gag gat tgt aaa gac atc aat gat 191
 Met Ala Pro Glu Lys Val Asp Phe Glu Asp Cys Lys Asp Ile Asn Asp
 50 55 60

 ttg aaa cag tat gac agt gat gag cca gaa aca agg tct ctt gca agt 239
 Leu Lys Gln Tyr Asp Ser Asp Glu Pro Glu Thr Arg Ser Leu Ala Ser
 65 70 75

 tgg att caa agt gag ttc aac aaa gct tgt gag ctg aca gat tca agc 287
 Trp Ile Gln Ser Glu Phe Asn Lys Ala Cys Glu Leu Thr Asp Ser Ser
 80 85 90 95

 tgg ata gag ctc gat gaa att ggg gag gat att gcc cca ata gaa tac 335
 Trp Ile Glu Leu Asp Glu Ile Gly Glu Asp Ile Ala Pro Ile Glu Tyr
 100 105 110

 att gcg agc atg agg aga aat tat ttt act gct gag gtt tcc cat tgt 383
 Ile Ala Ser Met Arg Arg Asn Tyr Phe Thr Ala Glu Val Ser His Cys
 115 120 125

 aga gca aca gaa tat ata atg aag gga gtg tac atc aac act gct cta 431
 Arg Ala Thr Glu Tyr Ile Met Lys Gly Val Tyr Ile Asn Thr Ala Leu
 130 135 140

 ctc aat gca tcc tgt gct gcg atg gat gaa ttc caa tta att ccg atg 479
 Leu Asn Ala Ser Cys Ala Ala Met Asp Glu Phe Gln Leu Ile Pro Met
 145 150 155

 ata agc aaa tgc agg acc aaa gaa ggg aga agg aag aca aat tta tat 527
 Ile Ser Lys Cys Arg Thr Lys Glu Gly Arg Arg Lys Thr Asn Leu Tyr
 160 165 170 175

EQ-1-C2-1.ST25.txt

| | |
|---|------|
| gga ttc ata ata aag gga agg tcc cat tta agg aat gat acc gac gtg Gly Phe Ile Ile Lys Gly Arg Ser His Leu Arg Asn Asp Thr Asp Val 180 185 190 | 575 |
| gta aac ttt gta agt atg gaa ttt tct ctc act gat cca aga ttt gag Val Asn Phe Val Ser Met Glu Phe Ser Leu Thr Asp Pro Arg Phe Glu 195 200 205 | 623 |
| cca cat aaa tgg gaa aaa tac tgc gtt cta gaa att gga gac atg ctc Pro His Lys Trp Glu Lys Tyr Cys Val Leu Glu Ile Gly Asp Met Leu 210 215 220 | 671 |
| cta agg act gct gta ggt caa gtg tca aga ccc atg ttt ttg tat gta Leu Arg Thr Ala Val Gly Gln Val Ser Arg Pro Met Phe Leu Tyr Val 225 230 235 | 719 |
| agg aca aat gga acc tct aaa att aaa atg aaa tgg gga atg gaa atg Arg Thr Asn Gly Thr Ser Lys Ile Lys Met Lys Trp Gly Met Glu Met 240 245 250 255 | 767 |
| aga cgc tgc ctc ctt cag tct ctg caa cag att gaa agc atg atc gaa Arg Arg Cys Leu Leu Gln Ser Leu Gln Gln Ile Glu Ser Met Ile Glu 260 265 270 | 815 |
| gct gag tcc tca gtc aaa gaa aag gac atg acc aaa gaa ttc ttt gag Ala Glu Ser Ser Val Lys Glu Lys Asp Met Thr Lys Glu Phe Phe Glu 275 280 285 | 863 |
| aac aaa tca gag aca tgg cct ata gga gag tcc ccc aaa gga gtg gaa Asn. Lys Ser Glu Thr Trp Pro Ile Gly Glu Ser Pro Lys Gly Val Glu 290 295 300 | 911 |
| gag ggc tca atc ggg aag gtt tgc agg acc tta tta gca aaa tct gtg Glu Gly Ser Ile Gly Lys Val Cys Arg Thr Leu Ala Lys Ser Val 305 310 315 | 959 |
| ttt aac agt ttg tat gca tct cca caa ctg gaa ggg ttt tca gct gaa Phe Asn Ser Leu Tyr Ala Ser Pro Gln Leu Glu Gly Phe Ser Ala Glu 320 325 330 335 | 1007 |
| tct agg aaa tta ctt ctc att gtt cag gcc ctt agg gat aac ctg gaa Ser Arg Lys Leu Leu Ile Val Gln Ala Leu Arg Asp Asn Leu Glu 340 345 350 | 1055 |
| cct gga acc ttt gat att ggg ggg tta tat gaa tca att gag gag tgc Pro Gly Thr Phe Asp Ile Gly Gly Leu Tyr Glu Ser Ile Glu Glu Cys 355 360 365 | 1103 |
| ctg att aat gat ccc tgg gtt ttg ctc aat gca tct tgg ttc aac tcc Leu Ile Asn Asp Pro Trp Val Leu Leu Asn Ala Ser Trp Phe Asn Ser 370 375 380 | 1151 |
| ttc ctt aca cat gca ctg aag tagttgttagc aatgctacta tttgctatcc Phe Leu Thr His Ala Leu Lys 385 390 | 1202 |
| atactgtcca aaaaagtacc ttgtttctac t | 1233 |

EQ-1-C2-1.ST25.txt

<210> 81

<211> 390

<212> PRT

<213> Equine influenza virus H3N8

<400> 81

Glu Lys Gly Ile Asn Pro Asn Tyr Leu Gln Ala Trp Lys Gln Val Leu
1 5 10 15

Ala Glu Leu Gln Asp Leu Glu Asn Glu Lys Thr Pro Lys Thr Lys
20 25 30

Asn Met Lys Lys Thr Ser Gln Leu Lys Trp Ala Leu Gly Glu Asn Met
35 40 45

Ala Pro Glu Lys Val Asp Phe Glu Asp Cys Lys Asp Ile Asn Asp Leu
50 55 60

Lys Gln Tyr Asp Ser Asp Glu Pro Glu Thr Arg Ser Leu Ala Ser Trp
65 70 75 80

Ile Gln Ser Glu Phe Asn Lys Ala Cys Glu Leu Thr Asp Ser Ser Trp
85 90 95

Ile Glu Leu Asp Glu Ile Gly Glu Asp Ile Ala Pro Ile Glu Tyr Ile
100 105 110

Ala Ser Met Arg Arg Asn Tyr Phe Thr Ala Glu Val Ser His Cys Arg
115 120 125

Ala Thr Glu Tyr Ile Met Lys Gly Val Tyr Ile Asn Thr Ala Leu Leu
130 135 140

Asn Ala Ser Cys Ala Ala Met Asp Glu Phe Gln Leu Ile Pro Met Ile
145 150 155 160

Ser Lys Cys Arg Thr Lys Glu Gly Arg Arg Lys Thr Asn Leu Tyr Gly
165 170 175

Phe Ile Ile Lys Gly Arg Ser His Leu Arg Asn Asp Thr Asp Val Val
180 185 190

Asn Phe Val Ser Met Glu Phe Ser Leu Thr Asp Pro Arg Phe Glu Pro
195 200 205

EQ-1-C2-1.ST25.txt

His Lys Trp Glu Lys Tyr Cys Val Leu Glu Ile Gly Asp Met Leu Leu
210 215 220

Arg Thr Ala Val Gly Gln Val Ser Arg Pro Met Phe Leu Tyr Val Arg
225 230 235 240

Thr Asn Gly Thr Ser Lys Ile Lys Met Lys Trp Gly Met Glu Met Arg
245 250 255

Arg Cys Leu Leu Gln Ser Leu Gln Gln Ile Glu Ser Met Ile Glu Ala
260 265 270

Glu Ser Ser Val Lys Glu Lys Asp Met Thr Lys Glu Phe Phe Glu Asn
275 280 285

Lys Ser Glu Thr Trp Pro Ile Gly Glu Ser Pro Lys Gly Val Glu Glu
290 295 300

Gly Ser Ile Gly Lys Val Cys Arg Thr Leu Leu Ala Lys Ser Val Phe
305 310 315 320

Asn Ser Leu Tyr Ala Ser Pro Gln Leu Glu Gly Phe Ser Ala Glu Ser
325 330 335

Arg Lys Leu Leu Leu Ile Val Gln Ala Leu Arg Asp Asn Leu Glu Pro
340 345 350

Gly Thr Phe Asp Ile Gly Gly Leu Tyr Glu Ser Ile Glu Glu Cys Leu
355 360 365

Ile Asn Asp Pro Trp Val Leu Leu Asn Ala Ser Trp Phe Asn Ser Phe
370 375 380

Leu Thr His Ala Leu Lys
385 390

<210> 82
<211> 1170
<212> DNA
<213> Equine influenza virus H3N8

<400> 82
gaaaaagggtta taaaacccaaa ctatctccaa gcttggaaagc aagtatttagc agaactacaa 60
gacccttgaga acgaagaaaa gacccctaag accaagaata tgaaaaaaaaac aagccaattg 120
aaatgggcac tcggtgaaaa tatggcacca gagaaagtgg attttgagga ttgtaaagac 180

EO-1-C2-1.ST25.txt

| | |
|---|------|
| atcaaatgatt tgaaaacagta tgacagtgtat gagccagaaaa caaggctctc tgcaagttgg | 240 |
| attcaaagtg agttcaacaa agcttgcgtat ctgacagattt caagctggat agagctcgat | 300 |
| gaaattgggg aggatattgc cccaaatagaa tacattgcga gcatgaggag aaattat | 360 |
| actgctgagg tttcccattt tagagcaaca gaatatataa tgaagggagt gtacatcaac | 420 |
| actgctctac tcaatgcattc ctgtgctgcg atggatgaat tccaattaat tccgatgata | 480 |
| agcaaatgca ggaccaaaga agggagaagg aagacaaattt tatatggatt cataataaag | 540 |
| ggaaggtccc atttaaggaa tgataccgac gtggtaact ttgttaagtat ggaattttct | 600 |
| ctcaactgatc caagatttga gccacataaa tggaaaaat actgcgttct agaaatttgg | 660 |
| gacatgctcc taaggactgc tgttaggtcaa gtgtcaagac ccattttttt gtatgttaagg | 720 |
| acaaaatggaa cctctaaaat taaaatgaaa tggggatgg aaatgagacg ctgcctcctt | 780 |
| cagtctctgc aacagatttga aagcatgatc gaagctgagt ctcagtcac agaaaaggac | 840 |
| atgaccaaaag aattcttttga gaacaaatca gagacatggc ctataggaga gtcccccaaa | 900 |
| ggagtggaaag agggctcaat cgggaaggtt tgcaggaccc tattagcaaa atctgtttt | 960 |
| aacagtttgt atgcatttc acacatggaa gggttttcag ctgaatctag gaaattactt | 1020 |
| ctcattgttc aggcccttag ggataacctg gaacctggaa ctttgatat tgggggggtta | 1080 |
| tatgaatcaa ttgaggagtg cctgatataat gatccctggg ttttgctcaa tgcatttgg | 1140 |
| ttcaacttcct tccttacaca tgcactgaag | 1170 |

```
<210> 83
<211> 25
<212> DNA
<213> Artificial sequence
```

<220>
<223> Synthetic Primer

<400> 83
ggggcggtta cccaaactat ctcca

25

```
<210> 84
<211> 27
<212> DNA
<213> Artificial sequence
```

<220>
<223> Synthetic Primer

<400> 84
gggggctcga gtactttttt ggacagt

27

EO-1-C2-1.ST25.txt

<210> 85
<211> 1234
<212> DNA
<213> Equine influenza virus H3N8

<220>
<221> CDS
<222> (1)..(1188)
<223>

EQ-1-C2-1.ST25.txt

180

185

190

| | |
|---|------|
| gat tat cgg tac aca tac cggtgc cat aga ggc gat acc cag ata caa | 624 |
| Asp Tyr Arg Tyr Thr Tyr Arg Cys His Arg Gly Asp Thr Gln Ile Gln | |
| 195 200 205 | |
| acc aga aga tcc ttt gag ttg aag aaa ctg tgg gaa cag act cga tca | 672 |
| Thr Arg Arg Ser Phe Glu Leu Lys Lys Leu Trp Glu Gln Thr Arg Ser | |
| 210 215 220 | |
| aag act ggt cta ctg gta tca gat ggg ggt cca aac cta tac aac atc | 720 |
| Lys Thr Gly Leu Leu Val Ser Asp Gly Gly Pro Asn Leu Tyr Asn Ile | |
| 225 230 235 240 | |
| aga aac cta cac atc ccg gaa gtc tgt ttg aaa tgg gag ctg atg gat | 768 |
| Arg Asn Leu His Ile Pro Glu Val Cys Leu Lys Trp Glu Leu Met Asp | |
| 245 250 255 | |
| gaa gat tat aaa ggg agg cta tgt aat cca ttg aat cct ttc gtt agc | 816 |
| Glu Asp Tyr Lys Gly Arg Leu Cys Asn Pro Leu Asn Pro Phe Val Ser | |
| 260 265 270 | |
| cac aaa gaa att gaa tca gtg aac agt gca gta atg oct gcg cat | 864 |
| His Lys Glu Ile Glu Ser Val Asn Ser Ala Val Val Met Pro Ala His | |
| 275 280 285 | |
| ggc cct gcc aaa agc atg gag tat gat gct gtt gca aca aca cac tct | 912 |
| Gly Pro Ala Lys Ser Met Glu Tyr Asp Ala Val Ala Thr Thr His Ser | |
| 290 295 300 | |
| tgg atc ccc aag agg aac ccgtccata ttg aac aca agt caa agg gga | 960 |
| Trp Ile Pro Lys Arg Asn Arg Ser Ile Leu Asn Thr Ser Gln Arg Gly | |
| 305 310 315 320 | |
| ata ctc gaa gat gag cag atg tat cag aaa tgc tgc aac ctg ttt gaa | 1008 |
| Ile Leu Glu Asp Glu Gln Met Tyr Gln Lys Cys Cys Asn Leu Phe Glu | |
| 325 330 335 | |
| aaa ttc ttc ccc agc agc tca tac aga aga cca gtc gga att tct agt | 1056 |
| Lys Phe Phe Pro Ser Ser Tyr Arg Arg Pro Val Gly Ile Ser Ser | |
| 340 345 350 | |
| atg gtt gag gcc atg gtg tcc agg gcc cgc att gat gca cga att gac | 1104 |
| Met Val Glu Ala Met Val Ser Arg Ala Arg Ile Asp Ala Arg Ile Asp | |
| 355 360 365 | |
| ttc gaa tct gga ccgtata aag aag gat gag ttc gct gag atc atg aag | 1152 |
| Phe Glu Ser Gly Arg Ile Lys Lys Asp Glu Phe Ala Glu Ile Met Lys | |
| 370 375 380 | |
| atc tgt tcc acc att gaa gag ctc aga cgg caa aaa tagtgaattt | 1198 |
| Ile Cys Ser Thr Ile Glu Glu Leu Arg Arg Gln Lys | |
| 385 390 395 | |
| agtttgatct tcgtaaaaaa atgccttgtt tctact | 1234 |

<210> 86
<211> 396

EQ-1-C2-1.ST25.txt

<212> PRT

<213> Equine influenza virus H3N8

<400> 86

Met Lys Leu Arg Thr Gln Ile Pro Ala Glu Met Leu Ala Ser Ile Asp
1 5 10 15

Leu Lys Tyr Phe Asn Asp Ser Thr Lys Lys Lys Ile Glu Lys Ile Arg
20 25 30

Pro Leu Leu Val Asp Gly Thr Ala Ser Leu Ser Pro Gly Met Met Met
35 40 45

Gly Met Phe Asn Met Leu Ser Thr Val Leu Gly Val Ser Ile Leu Asn
50 55 60

Leu Gly Gln Arg Lys Tyr Thr Lys Thr Tyr Trp Trp Asp Gly Leu
65 70 75 80

Gln Ser Ser Asp Asp Phe Ala Leu Ile Val Asn Ala Pro Asn His Glu
85 90 95

Gly Ile Gln Ala Gly Val Asp Arg Phe Tyr Arg Thr Cys Lys Leu Val
100 105 110

Gly Ile Asn Met Ser Lys Lys Ser Tyr Ile Asn Arg Thr Gly Thr
115 120 125

Phe Glu Phe Thr Ser Phe Phe Tyr Arg Tyr Gly Phe Val Ala Asn Phe
130 135 140

Ser Met Glu Leu Pro Ser Phe Gly Val Ser Gly Ile Asn Glu Ser Ala
145 150 155 160

Asp Met Ser Ile Gly Met Thr Val Ile Lys Asn Asn Met Ile Asn Asn
165 170 175

Asp Leu Gly Pro Ala Thr Ala Gln Met Ala Leu Gln Leu Phe Ile Lys
180 185 190

Asp Tyr Arg Tyr Thr Tyr Arg Cys His Arg Gly Asp Thr Gln Ile Gln
195 200 205

Thr Arg Arg Ser Phe Glu Leu Lys Lys Leu Trp Glu Gln Thr Arg Ser
210 215 220

EQ-1-C2-1.ST25.txt

Lys Thr Gly Leu Leu Val Ser Asp Gly Gly Pro Asn Leu Tyr Asn Ile
225 230 235 240

Arg Asn Leu His Ile Pro Glu Val Cys Leu Lys Trp Glu Leu Met Asp
245 250 255

Glu Asp Tyr Lys Gly Arg Leu Cys Asn Pro Leu Asn Pro Phe Val Ser
260 265 270

His Lys Glu Ile Glu Ser Val Asn Ser Ala Val Val Met Pro Ala His
275 280 285

Gly Pro Ala Lys Ser Met Glu Tyr Asp Ala Val Ala Thr Thr His Ser
290 295 300

Trp Ile Pro Lys Arg Asn Arg Ser Ile Leu Asn Thr Ser Gln Arg Gly
305 310 315 320

Ile Leu Glu Asp Glu Gln Met Tyr Gln Lys Cys Cys Asn Leu Phe Glu
325 330 335

Lys Phe Phe Pro Ser Ser Tyr Arg Arg Pro Val Gly Ile Ser Ser
340 345 350

Met Val Glu Ala Met Val Ser Arg Ala Arg Ile Asp Ala Arg Ile Asp
355 360 365

Phe Glu Ser Gly Arg Ile Lys Lys Asp Glu Phe Ala Glu Ile Met Lys
370 375 380

Ile Cys Ser Thr Ile Glu Glu Leu Arg Arg Gln Lys
385 390 395

<210> 87
<211> 1188
<212> DNA
<213> Equine influenza virus H3N8

<400> 87
atgaaattga gaactcaa ataccaggc aa atgctcgca gcattgatct gaaatatttc 60
aatgattcaa caaaaaagaa aattgagaag atacgaccac ttctggtcga tgggactgct 120
tcactgagtc ctggcatgtat gatggaaatg ttcaacatgt tgagcactgt actaggtgt 180
tccatattaa acctgggcc a gaggaaatac acaaagacca catactggtg ggtatggctg 240

EQ-1-C2-1.ST25.txt

| | |
|--|------|
| caatcatccg atgattttgc ttgtatagtg aatgcgccta atcatgaagg aatacaggct | 300 |
| ggagtagaca gattctatacg aacttgcaaa ctggtcggga tcaacatgag caaaaagaag | 360 |
| tcctacataa atagaaccgg cacattcgaa ttcacaagct ttttctaccg gtatggttt | 420 |
| gtcgccaatt tcagcatgga gctacccagt tttggggttt ccgggataaaa tgaatctgca | 480 |
| gacatgagca ttggaatgac agtttatcaaa aacaacatga taaataatga tctcggtccc | 540 |
| gccacggcac aaatggcact ccaactcttc attaaggatt atcggtacac ataccggtgc | 600 |
| catagaggcg atacccagat acaaaccaga agatcccttg agttgaagaa actgtggaa | 660 |
| cagactcgat caaagactgg tctactggta tcagatgggg gtccaaacct atacaacatc | 720 |
| agaaacctac acatcccgga agtctgtttt aaatgggagc tgatggatga agattataaa | 780 |
| gggaggctat gtaatccatt gaatccttgc gttagccaca aagaaattga atcagtgaac | 840 |
| agtgcagtag taatgcctgc gcatggccct gccaaaagca tggagtatga tgctgttgc | 900 |
| acaacacact cttggatccc caagaggaac cggtccatat tgaacacaag tcaaaggaa | 960 |
| atactcgaag atgagcagat gtatcagaaa tgctgcaacc tgtttggaaaa attcttcccc | 1020 |
| agcagctcat acagaagacc agtcggaatt tctagttatgg ttgaggccat ggtgtccagg | 1080 |
| gccccgcattg atgcacgaat tgacttcgaa tctggacgga taaagaagga tgagttcgct | 1140 |
| gagatcatga agatctgttc caccattgaa gagctcagac ggcaaaaa | 1188 |

<210> 88
<211> 1240
<212> DNA
<213> Equine influenza virus H3N8

<220>
<221> CDS
<222> (8)..(1195)
<223>

| | |
|--|-----|
| <400> 88 | |
| caaaaagt atg aaa ttg aga act caa ata cca gca gaa atg ctc gca agc | 49 |
| Met Lys Leu Arg Thr Gln Ile Pro Ala Glu Met Leu Ala Ser | |
| 1 5 10 | |
| att gat ctg aaa tat ttc aat gat tca aca aaa aag aaa att gag aag | 97 |
| Ile Asp Leu Lys Tyr Phe Asn Asp Ser Thr Lys Lys Lys Ile Glu Lys | |
| 15 20 25 30 | |
| ata cga cca ctt ctg gtc gat ggg act gct tca ctg agt cct ggc atg | 145 |
| Ile Arg Pro Leu Leu Val Asp Gly Thr Ala Ser Leu Ser Pro Gly Met | |
| 35 40 45 | |
| atg atg gga atg ttc aac atg ttg agc act gta cta ggt gta tcc ata | 193 |

EQ-1-C2-1.ST25.txt

| | | | |
|---|-----|-----|-----|
| Met Met Gly Met Phe Asn Met Leu Ser Thr Val Leu Gly Val Ser Ile | | | |
| 50 | 55 | 60 | |
| tta aac ctg ggc cag agg aaa tac aca aag acc aca tac tgg tgg gat | | | 241 |
| Leu Asn Leu Gly Gln Arg Lys Tyr Thr Lys Thr Thr Tyr Trp Trp Asp | | | |
| 65 | 70 | 75 | |
| ggt ctg caa tca tcc gat gat ttt gct ttg ata gtg aat gcg cct aat | | | 289 |
| Gly Leu Gln Ser Ser Asp Asp Phe Ala Leu Ile Val Asn Ala Pro Asn | | | |
| 80 | 85 | 90 | |
| cat gaa gga ata cag gct gga gta gac aga ttc tat aga act tgc aaa | | | 337 |
| His Glu Gly Ile Gln Ala Gly Val Asp Arg Phe Tyr Arg Thr Cys Lys | | | |
| 95 | 100 | 105 | 110 |
| ctg gtc ggg atc aac atg agc aaa aag aag tcc tac ata aat aga acc | | | 385 |
| Leu Val Gly Ile Asn Met Ser Lys Lys Ser Tyr Ile Asn Arg Thr | | | |
| 115 | 120 | 125 | |
| ggc tca ttc gaa ttc aca agc ttt ttc tac cgg tat ggt ttt gtc gcc | | | 433 |
| Gly Ser Phe Glu Phe Thr Ser Phe Phe Tyr Arg Tyr Gly Phe Val Ala | | | |
| 130 | 135 | 140 | |
| aat ttc agc atg gag cta ccc agt ttt ggg gtt tcc ggg ata aat gaa | | | 481 |
| Asn Phe Ser Met Glu Leu Pro Ser Phe Gly Val Ser Gly Ile Asn Glu | | | |
| 145 | 150 | 155 | |
| tct gca gac atg agc att gga atg aca gtt atc aaa aac aac atg ata | | | 529 |
| Ser Ala Asp Met Ser Ile Gly Met Thr Val Ile Lys Asn Asn Met Ile | | | |
| 160 | 165 | 170 | |
| aat aat gat ctc ggt ccc gcc acg gca caa atg gca ctc caa ctc ttc | | | 577 |
| Asn Asn Asp Leu Gly Pro Ala Thr Ala Gln Met Ala Leu Gln Leu Phe | | | |
| 175 | 180 | 185 | 190 |
| att aag gat tat cgg tac aca tac cgg tgc cat aga ggc gat acc cag | | | 625 |
| Ile Lys Asp Tyr Arg Tyr Thr Arg Cys His Arg Gly Asp Thr Gln | | | |
| 195 | 200 | 205 | |
| ata caa acc aga aga tcc ttt gag ttg aag aaa ctg tgg gaa cag act | | | 673 |
| Ile Gln Thr Arg Arg Ser Phe Glu Leu Lys Lys Leu Trp Glu Gln Thr | | | |
| 210 | 215 | 220 | |
| cga tca aag act ggt cta ctg gta tca gat ggg ggt cca aac cta tac | | | 721 |
| Arg Ser Lys Thr Gly Leu Leu Val Ser Asp Gly Gly Pro Asn Leu Tyr | | | |
| 225 | 230 | 235 | |
| aac atc aga aac cta cac atc ccg gaa gtc tgt ttg aaa tgg gag ctg | | | 769 |
| Asn Ile Arg Asn Leu His Ile Pro Glu Val Cys Leu Lys Trp Glu Leu | | | |
| 240 | 245 | 250 | |
| atg gat gaa gat tat aaa ggg agg cta tgt aat cca ttg aat cct ttc | | | 817 |
| Met Asp Glu Asp Tyr Lys Gly Arg Leu Cys Asn Pro Leu Asn Pro Phe | | | |
| 255 | 260 | 265 | 270 |
| gtt agc cac aaa gaa att gaa tca gtg aac agt gca gta gta atg cct | | | 865 |
| Val Ser His Lys Glu Ile Glu Ser Val Asn Ser Ala Val Val Met Pro | | | |
| 275 | 280 | 285 | |

EQ-1-C2-1.ST25.txt

| | |
|---|------|
| gct cat ggc cct gcc aaa agc atg gag tat gat gct gtt gca aca aca Ala His Pro Ala Lys Ser Met Glu Tyr Asp Ala Val Ala Thr Thr 290 295 300 | 913 |
| cac tct tgg atc ccc aag agg aac cgg tcc ata ttg aac aca agt caa His Ser Trp Ile Pro Lys Arg Asn Arg Ser Ile Leu Asn Thr Ser Gln 305 310 315 | 961 |
| agg gga ata ctc gaa gat gag cag atg tat cag aaa tgc tgc aac ctg Arg Gly Ile Leu Glu Asp Glu Gln Met Tyr Gln Lys Cys Cys Asn Leu 320 325 330 | 1009 |
| ttt gaa aaa ttc ttc ccc agc agc tca tac aga aga cca gtc gga att Phe Glu Lys Phe Phe Pro Ser Ser Tyr Arg Arg Pro Val Gly Ile 335 340 345 350 | 1057 |
| tct agt atg gtt gag gcc atg gtg tcc agg gcc cgc att gat gca cga Ser Ser Met Val Glu Ala Met Val Ser Arg Ala Arg Ile Asp Ala Arg 355 360 365 | 1105 |
| att gac ttc gaa tct gga cgg ata aag aag gat gag ttc gct gag atc Ile Asp Phe Glu Ser Gly Arg Ile Lys Lys Asp Glu Phe Ala Glu Ile 370 375 380 | 1153 |
| atg aag atc tgt tcc acc att gaa gag ctc aga cgg caa aaa Met Lys Ile Cys Ser Thr Ile Glu Glu Leu Arg Arg Gln Lys 385 390 395 | 1195 |
| tagtgaaattt agcttgatct tcgtgaaaaa atgccttggtt ctact | 1240 |
| | |
| <210> 89 | |
| <211> 396 | |
| <212> PRT | |
| <213> Equine influenza virus H3N8 | |
| | |
| <400> 89 | |
| Met Lys Leu Arg Thr Gln Ile Pro Ala Glu Met Leu Ala Ser Ile Asp 1 5 10 15 | |
| Leu Lys Tyr Phe Asn Asp Ser Thr Lys Lys Lys Ile Glu Lys Ile Arg 20 25 30 | |
| Pro Leu Leu Val Asp Gly Thr Ala Ser Leu Ser Pro Gly Met Met Met 35 40 45 | |
| Gly Met Phe Asn Met Leu Ser Thr Val Leu Gly Val Ser Ile Leu Asn 50 55 60 | |
| Leu Gly Gln Arg Lys Tyr Thr Lys Thr Tyr Trp Trp Asp Gly Leu 65 70 75 80 | |
| Gln Ser Ser Asp Asp Phe Ala Leu Ile Val Asn Ala Pro Asn His Glu | |

Gly Ile Gln Ala Gly Val Asp Arg Phe Tyr Arg Thr Cys Lys Leu Val
100 105 110

Gly Ile Asn Met Ser Lys Lys Ser Tyr Ile Asn Arg Thr Gly Ser
115 120 125

Phe Glu Phe Thr Ser Phe Phe Tyr Arg Tyr Gly Phe Val Ala Asn Phe
130 135 140

Ser Met Glu Leu Pro Ser Phe Gly Val Ser Gly Ile Asn Glu Ser Ala
145 150 155 160

Asp Met Ser Ile Gly Met Thr Val Ile Lys Asn Asn Met Ile Asn Asn
165 170 175

Asp Leu Gly Pro Ala Thr Ala Gln Met Ala Leu Gln Leu Phe Ile Lys
180 185 190

Asp Tyr Arg Tyr Thr Tyr Arg Cys His Arg Gly Asp Thr Gln Ile Gln
195 200 205

Thr Arg Arg Ser Phe Glu Leu Lys Lys Leu Trp Glu Gln Thr Arg Ser
210 215 220

Lys Thr Gly Leu Leu Val Ser Asp Gly Gly Pro Asn Leu Tyr Asn Ile
225 230 235 240

Arg Asn Leu His Ile Pro Glu Val Cys Leu Lys Trp Glu Leu Met Asp
245 250 255

Glu Asp Tyr Lys Gly Arg Leu Cys Asn Pro Leu Asn Pro Phe Val Ser
260 265 270

His Lys Glu Ile Glu Ser Val Asn Ser Ala Val Val Met Pro Ala His
275 280 285

Gly Pro Ala Lys Ser Met Glu Tyr Asp Ala Val Ala Thr Thr His Ser
290 295 300

Trp Ile Pro Lys Arg Asn Arg Ser Ile Leu Asn Thr Ser Gln Arg Gly
305 310 315 320

EQ-1-C2-1.ST25.txt

Ile Leu Glu Asp Glu Gln Met Tyr Gln Lys Cys Cys Asn Leu Phe Glu
 325 330 335

Lys Phe Phe Pro Ser Ser Tyr Arg Arg Pro Val Gly Ile Ser Ser
 340 345 350

Met Val Glu Ala Met Val Ser Arg Ala Arg Ile Asp Ala Arg Ile Asp
 355 360 365

Phe Glu Ser Gly Arg Ile Lys Lys Asp Glu Phe Ala Glu Ile Met Lys
 370 375 380

Ile Cys Ser Thr Ile Glu Glu Leu Arg Arg Gln Lys
 385 390 395

<210> 90
<211> 1188
<212> DNA
<213> Equine influenza virus H3N8

| | | |
|---|------|--|
| <400> 90 | | |
| atgaaaattga gaactcaa at accagcagaa atgctcgca gcatttatct gaaatatttc | 60 | |
| aatgattcaa caaaaaagaa aattgagaag atacgaccac ttctggtcga tgggactgct | 120 | |
| tcactgagtc ctggcatgtat gatggaaatg ttcaacatgt tgaggactgt actagggtta | 180 | |
| tccatattaa acctggcca gagaaatac acaaagacca catactggtg ggatggctcg | 240 | |
| caatcatccg atgatttgc tttgatagt aatgcgccta atcatgaagg aatacaggct | 300 | |
| ggagtagaca gattctatag aacttgcaaa ctggtcggga tcaacatgag caaaaagaag | 360 | |
| tcctacataa atagaaccgg ctcatcgaa ttccacaagct ttttctaccg gtatggttt | 420 | |
| gtcgccatt tcagcatgga gctacccagt tttggggtt ccgggataaa tgaatctgca | 480 | |
| gacatgagca ttggaatgac agttatcaaa aacaacatga taaataatga tctcggtccc | 540 | |
| gccacggcac aaatggcact ccaactcttc attaaggatt atcggtacac ataccgggtgc | 600 | |
| catagaggcg atacccagat acaaaccaga agatcccttg agttgaagaa actgtggaa | 660 | |
| cagactcgat caaagactgg tctactggta tcagatgggg gtccaaacct atacaacatc | 720 | |
| agaaaacctac acatccccga agtctgtttg aaatgggagc tgatggatga agattataaa | 780 | |
| gggaggctat gtaatccatt gaatccccc gttagccaca aagaaattga atcagtgaac | 840 | |
| agtgcagtag taatgcctgc gcatggccct gccaaaagca tggagtatga tgctgttgc | 900 | |
| acaacacact cttggatccc caagaggaac cggtccatat tgaacacacaag tcaaagggaa | 960 | |
| atactcgaag atgagcagat gtatcagaaa tgctgcaacc tgtttggaaa attctcccc | 1020 | |

EQ-1-C2-1.ST25.txt

| | |
|--|------|
| agcagctcat acagaagacc agtcggaatt tctagtatgg ttgaggccat ggtgtccagg | 1080 |
| ccccgcattg atgcacgaat tgacttcgaa tctggacgga taaaagaagga tgagttcgct | 1140 |
| gagatcatga agatctgttc caccattgaa gagctcagac ggcaaaaa | 1188 |

<210> 91
 <211> 1241
 <212> DNA
 <213> Equine influenza virus H3N8

 <220>
 <221> CDS
 <222> (8)..(1195)
 <223>

| | |
|--|-----|
| <400> 91 caaaagt atg aaa ttg aga actcaa ata cca gca gaa atg ctc gca agc Met Lys Leu Arg Thr Gln Ile Pro Ala Glu Met Leu Ala Ser 1 5 10 | 49 |
| att gat ctg aaa tat ttc aat gat tca aca aaa aag aaa att gag aag Ile Asp Leu Lys Tyr Phe Asn Asp Ser Thr Lys Lys Lys Ile Glu Lys 15 20 25 30 | 97 |
| ata cga cca ctt ctg gtc gat ggg act gct tca ctg agt cct ggc atg Ile Arg Pro Leu Leu Val Asp Gly Thr Ala Ser Leu Ser Pro Gly Met 35 40 45 | 145 |
| atg atg gga atg ttc aac atg ttg agc act gta cta ggt gta tcc ata Met Met Gly Met Phe Asn Met Leu Ser Thr Val Leu Gly Val Ser Ile 50 55 60 | 193 |
| tta aac ctg ggc cag agg aaa tac aca aag acc aca tac tgg tgg gat Leu Asn Leu Gly Gln Arg Lys Tyr Thr Lys Thr Tyr Trp Trp Asp 65 70 75 | 241 |
| ggt ctg caa tca tcc gat gat ttt gct ttg ata gtg aat gcg cct aat Gly Leu Gln Ser Ser Asp Asp Phe Ala Leu Ile Val Asn Ala Pro Asn 80 85 90 | 289 |
| cat gaa gga ata cag gct gga gta gac aga ttg tat aga act tgc aaa His Glu Gly Ile Gln Ala Gly Val Asp Arg Phe Tyr Arg Thr Cys Lys 95 100 105 110 | 337 |
| ctg gtc ggg atc aac atg agc aaa aag aag tcc tac ata aat aga acc Leu Val Gly Ile Asn Met Ser Lys Lys Ser Tyr Ile Asn Arg Thr 115 120 125 | 385 |
| ggc aca ttc gaa ttc aca agc ttt ttc tac cgg tat ggt ttt gtc gcc Gly Thr Phe Glu Phe Thr Ser Phe Phe Tyr Arg Tyr Gly Phe Val Ala 130 135 140 | 433 |
| aat ttc agc atg gag cta ccc agt ttt ggg gtt tcc ggg ata aat gaa Asn Phe Ser Met Glu Leu Pro Ser Phe Gly Val Ser Gly Ile Asn Glu 145 150 155 | 481 |

EQ-1-C2-1.ST25.txt

| | |
|---|------|
| tct gca gac atg agc att gga atg aca gtt atc aaa aac aac atg ata Ser Ala Asp Met Ser Ile Gly Met Thr Val Ile Lys Asn Asn Met Ile 160 165 170 | 529 |
| aat aat gat ctc ggt ccc gcc acg gca caa atg gca ctc caa ctc ttc Asn Asn Asp Leu Gly Pro Ala Thr Ala Gln Met Ala Leu Gln Leu Phe 175 180 185 190 | 577 |
| att aag gat tat cgg tac aca tac cgg tgt caa aga ggc gat acc cag Ile Lys Asp Tyr Arg Tyr Thr Arg Cys Gln Arg Gly Asp Thr Gln 195 200 205 | 625 |
| ata caa acc aga aga tcc ttt gag ttg aag aaa ctg tgg gaa cag act Ile Gln Thr Arg Arg Ser Phe Glu Leu Lys Lys Leu Trp Glu Gln Thr 210 215 220 | 673 |
| cga tca aag act ggt cta ctg gta tca gat ggg ggt cca aac cta tac Arg Ser Lys Thr Gly Leu Leu Val Ser Asp Gly Gly Pro Asn Leu Tyr 225 230 235 | 721 |
| aac atc aga aac cta cac atc ccg gaa gtc tgt ttg aaa tgg gag ctg Asn Ile Arg Asn Leu His Ile Pro Glu Val Cys Leu Lys Trp Glu Leu 240 245 250 | 769 |
| atg gat gaa gat tat aaa ggg agg cta tgt aat cca ttg aat cct ttc Met Asp Glu Asp Tyr Lys Gly Arg Leu Cys Asn Pro Leu Asn Pro Phe 255 260 265 270 | 817 |
| gtt agc cac aaa gaa att gaa tca gtg aac agt gca gta gta atg cct Val Ser His Lys Glu Ile Glu Ser Val Asn Ser Ala Val Val Met Pro 275 280 285 | 865 |
| gcg cat ggc cct gcc aaa agc atg gag tat gat gct gtc gca aca aca Ala His Gly Pro Ala Lys Ser Met Glu Tyr Asp Ala Val Ala Thr Thr 290 295 300 | 913 |
| cac tct tgg atc ccc aag agg aac ccg tcc ata ttg aac aca agt caa His Ser Trp Ile Pro Lys Arg Asn Arg Ser Ile Leu Asn Thr Ser Gln 305 310 315 | 961 |
| agg gga ata ctc gaa gat gag cag atg tat cag aaa tgc tgc aac ctg Arg Gly Ile Leu Glu Asp Glu Gln Met Tyr Gln Lys Cys Cys Asn Leu 320 325 330 | 1009 |
| ttt gaa aaa ttc ttc ccc agc agc tca tac aga aaa cca gtc gga att Phe Glu Lys Phe Phe Pro Ser Ser Tyr Arg Lys Pro Val Gly Ile 335 340 345 350 | 1057 |
| tct agt atg gtt gag gcc atg gtg tcc agg gcc cgc att gat gca cga Ser Ser Met Val Glu Ala Met Val Ser Arg Ala Arg Ile Asp Ala Arg 355 360 365 | 1105 |
| att gac ttc gaa tct gga cgg ata aag aag gat gag ttc gct gag atc Ile Asp Phe Glu Ser Gly Arg Ile Lys Lys Asp Glu Phe Ala Glu Ile 370 375 380 | 1153 |
| atg aag atc tgt tcc acc att gaa gag ctc aga cgg caa aaa Met Lys Ile Cys Ser Thr Ile Glu Leu Arg Arg Gln Lys | 1195 |

EQ-1-C2-1.ST25.txt
385 390 395

tagtgaattt agcttgatct tcgtaaaaaa atgccttgtt tctact 1241

<210> 92
<211> 396
<212> PRT
<213> Equine influenza virus H3N8

<400> 92

Met Lys Leu Arg Thr Gln Ile Pro Ala Glu Met Leu Ala Ser Ile Asp
1 . 5 10 15

Leu Lys Tyr Phe Asn Asp Ser Thr Lys Lys Lys Ile Glu Lys Ile Arg
20 25 30

Pro Leu Leu Val Asp Gly Thr Ala Ser Leu Ser Pro Gly Met Met Met
35 40 45

Gly Met Phe Asn Met Leu Ser Thr Val Leu Gly Val Ser Ile Leu Asn
50 55 60

Leu Gly Gln Arg Lys Tyr Thr Lys Thr Tyr Trp Trp Asp Gly Leu
65 70 75 80

Gln Ser Ser Asp Asp Phe Ala Leu Ile Val Asn Ala Pro Asn His Glu
85 90 95

Gly Ile Gln Ala Gly Val Asp Arg Phe Tyr Arg Thr Cys Lys Leu Val
100 105 110

Gly Ile Asn Met Ser Lys Lys Ser Tyr Ile Asn Arg Thr Gly Thr
115 120 125

Phe Glu Phe Thr Ser Phe Phe Tyr Arg Tyr Gly Phe Val Ala Asn Phe
130 135 140

Ser Met Glu Leu Pro Ser Phe Gly Val Ser Gly Ile Asn Glu Ser Ala
145 150 155 160

Asp Met Ser Ile Gly Met Thr Val Ile Lys Asn Asn Met Ile Asn Asn
165 170 175

Asp Leu Gly Pro Ala Thr Ala Gln Met Ala Leu Gln Leu Phe Ile Lys
180 185 190

EQ-1-C2-1.ST25.txt

Asp Tyr Arg Tyr Thr Tyr Arg Cys Gln Arg Gly Asp Thr Gln Ile Gln
195 200 205

Thr Arg Arg Ser Phe Glu Leu Lys Lys Leu Trp Glu Gln Thr Arg Ser
210 215 220

Lys Thr Gly Leu Leu Val Ser Asp Gly Gly Pro Asn Leu Tyr Asn Ile
225 230 235 240

Arg Asn Leu His Ile Pro Glu Val Cys Leu Lys Trp Glu Leu Met Asp
245 250 255

Glu Asp Tyr Lys Gly Arg Leu Cys Asn Pro Leu Asn Pro Phe Val Ser
260 265 270

His Lys Glu Ile Glu Ser Val Asn Ser Ala Val Val Met Pro Ala His
275 280 285

Gly Pro Ala Lys Ser Met Glu Tyr Asp Ala Val Ala Thr Thr His Ser
290 295 300

Trp Ile Pro Lys Arg Asn Arg Ser Ile Leu Asn Thr Ser Gln Arg Gly
305 310 315 320

Ile Leu Glu Asp Glu Gln Met Tyr Gln Lys Cys Cys Asn Leu Phe Glu
325 330 335

Lys Phe Phe Pro Ser Ser Tyr Arg Lys Pro Val Gly Ile Ser Ser
340 345 350

Met Val Glu Ala Met Val Ser Arg Ala Arg Ile Asp Ala Arg Ile Asp
355 360 365

Phe Glu Ser Gly Arg Ile Lys Lys Asp Glu Phe Ala Glu Ile Met Lys
370 375 380

Ile Cys Ser Thr Ile Glu Glu Leu Arg Arg Gln Lys
385 390 395

<210> 93
<211> 1188
<212> DNA
<213> Equine influenza virus H3N8

<400> 93

EQ-1-C2-1.ST25.txt

| | | | | | | |
|-------------|-------------|---------------|------------|------------|------------|------|
| atgaaattga | gaactcaa | at accagcagaa | atgctcgaa | gcattgatct | gaaatattc | 60 |
| aatgattcaa | caaaaaagaa | aattgagaag | atacgaccac | ttctggtcga | tgggactgct | 120 |
| tcactgagtc | ctggcatgtat | gatggaaatg | ttcaacatgt | tgagcactgt | actagggtgt | 180 |
| tccatattaa | acctggcca | gaggaaatac | acaaagacca | catactggtg | ggatggtctg | 240 |
| caatcatccg | atgattttgc | tttgatagt | aatgcgccta | atcatgaagg | aatacaggct | 300 |
| ggagtagaca | gattctatag | aacttgcaaa | ctggtcggga | tcaacatgag | caaaaagaag | 360 |
| tcctacataa | atagaaccgg | cacattcgaa | ttcacaagct | tttctaccg | gtatggttt | 420 |
| gtcgccaatt | tcagcatgga | gctacccagt | tttggggttt | ccgggataaa | tgaatctgca | 480 |
| gacatgagca | ttggaatgac | agttatcaaa | aacaacatga | taaataatga | tctcggtccc | 540 |
| gccacggcac | aaatggcact | ccaaactttc | attaaggatt | atcggtacac | ataccggtgt | 600 |
| caaagaggcg | ataccagat | acaaaccaga | agatccttg | agttgaagaa | actgtggaa | 660 |
| cagactcgat | caaagactgg | tctactggta | tcagatgggg | gtccaaacct | atacaacatc | 720 |
| agaaacctac | acatcccgga | agtctgttt | aatgggagc | tgatggatga | agattataaa | 780 |
| gggaggctat | gtaatccatt | gaatccttc | gttagccaca | aagaaattga | atcagtgaac | 840 |
| agtgcagtag | taatgcctgc | gcatggccct | gccaaaagca | tggagtatga | tgctgttgca | 900 |
| acaacacact | cttggatccc | caagaggaac | cggtccatat | tgaacacaag | tcaaagggga | 960 |
| atactcgaag | atgagcagat | gtatcagaaa | tgctgcaacc | tgttgaaaaa | attctcccc | 1020 |
| agcagctcat | acagaaaacc | agtccgaatt | tctagtatgg | ttgaggccat | ggtgtccagg | 1080 |
| gcccgatttgc | atgcacgaat | tgacttcgaa | tctggacgga | taaagaagga | tgagttcgct | 1140 |
| gagatcatga | agatctgttc | caccattgaa | gagctcagac | ggcaaaaa | | 1188 |

<210> 94

<211> 1241

<212> DNA

<213> Equine influenza virus H3N8

<220>

<221> CDS

<222> (8)...(1195)

<223>

<400> 94

| | | | | | | | | | | | | | | |
|----------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| caaaaagt | atg | aaa | ttg | aga | act | caa | ata | cca | gca | gaa | atg | ctc | gca | agc |
| | Met | Lys | Leu | Arg | Thr | Gln | Ile | Pro | Ala | Glu | Met | Leu | Ala | Ser |
| 1 | | | | | | | 5 | | | | | | 10 | |

49

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| att | gat | ctg | aaa | tat | ttc | aat | gat | tca | aca | aaa | aag | aaa | att | gag | aag |
| Ile | Asp | Leu | Lys | Tyr | Phe | Asn | Asp | Ser | Thr | Lys | Lys | Ile | Glu | Lys | |

97

EQ-1-C2-1.ST25.txt

| 15 | 20 | 25 | 30 | |
|--|-----|-----|-----|-----|
| ata cga cca ctt ctg gtc gat ggg act gct tca ctg agt cct ggc atg Ile Arg Pro Leu Leu Val Asp Gly Thr Ala Ser Leu Ser Pro Gly Met | 35 | 40 | 45 | 145 |
| atg atg gga atg ttc aac atg ttg agc act gta cta ggt gta tcc ata Met Met Gly Met Phe Asn Met Leu Ser Thr Val Leu Gly Val Ser Ile | 50 | 55 | 60 | 193 |
| tta aac ctg ggc cag agg aaa tac aca aag acc aca tac tgg tgg gat Leu Asn Leu Gly Gln Arg Lys Tyr Thr Lys Thr Tyr Trp Trp Asp | 65 | 70 | 75 | 241 |
| ggt ctg caa tca tcc gat gat ttt gct ttg ata gtg aat gcg cct aat Gly Leu Gln Ser Ser Asp Asp Phe Ala Leu Ile Val Asn Ala Pro Asn | 80 | 85 | 90 | 289 |
| cat gaa gga ata cag gct gga gta gac aga ttc tat aga act tgc aaa His Glu Gly Ile Gln Ala Gly Val Asp Arg Phe Tyr Arg Thr Cys Lys | 95 | 100 | 105 | 110 |
| ctg gtc ggg atc aac atg agc aaa aag aag tcc tac ata aat aga acc Leu Val Gly Ile Asn Met Ser Lys Lys Ser Tyr Ile Asn Arg Thr | 115 | 120 | 125 | 385 |
| ggc aca ttc gaa ttc aca agc ttt ttc tac cgg tat ggt ttt gtc gcc Gly Thr Phe Glu Phe Thr Ser Phe Phe Tyr Arg Tyr Gly Phe Val Ala | 130 | 135 | 140 | 433 |
| aat ttc agc atg gag cta ccc agt ttt ggg gtt tcc ggg ata aat gaa Asn Phe Ser Met Glu Leu Pro Ser Phe Gly Val Ser Gly Ile Asn Glu | 145 | 150 | 155 | 481 |
| tct gca gac atg agc att gga atg aca gtt atc aaa aac aac atg ata Ser Ala Asp Met Ser Ile Gly Met Thr Val Ile Lys Asn Asn Met Ile | 160 | 165 | 170 | 529 |
| aat aat gat ctc ggt ccc gcc acg gca caa atg gca ctc caa ctc ttc Asn Asn Asp Leu Gly Pro Ala Thr Ala Gln Met Ala Leu Gln Leu Phe | 175 | 180 | 185 | 190 |
| att aag gat tat cgg tac aca tac cgg tgt caa aga ggc gat acc cag Ile Lys Asp Tyr Arg Tyr Thr Arg Cys Gln Arg Gly Asp Thr Gln | 195 | 200 | 205 | 625 |
| ata caa acc aga aga tcc ttt gag ttg aag aaa ctg tgg gaa cag act Ile Gln Thr Arg Arg Ser Phe Glu Leu Lys Lys Leu Trp Glu Gln Thr | 210 | 215 | 220 | 673 |
| cga tca aag act ggt cta ctg gta tca gat ggg ggt cca aac cta tac Arg Ser Lys Thr Gly Leu Leu Val Ser Asp Gly Gly Pro Asn Leu Tyr | 225 | 230 | 235 | 721 |
| aac atc aga aac cta cac atc ccg gaa gtc tgt ttg aaa tgg gag ctg Asn Ile Arg Asn Leu His Ile Pro Glu Val Cys Leu Lys Trp Glu Leu | 240 | 245 | 250 | 769 |
| atg. gat gaa gat tat aaa ggg agg cta tgt aat cca ttg aat cct ttc | | | | 817 |

EQ-1-C2-1.ST25.txt

| | | | |
|---|-----|-----|------|
| Met Asp Glu Asp Tyr Lys Gly Arg Leu Cys Asn Pro Leu Asn Pro Phe | | | |
| 255 | 260 | 265 | 270 |
| gtt agc cac aaa gaa att gaa tca gtg aac agt gca gta gta atg cct | | | 865 |
| Val Ser His Lys Glu Ile Glu Ser Val Asn Ser Ala Val Val Met Pro | | | |
| 275 | 280 | 285 | |
| gcg cat ggc cct gcc aaa agc atg gag tat gat gtc gca aca aca | | | 913 |
| Ala His Gly Pro Ala Lys Ser Met Glu Tyr Asp Ala Val Ala Thr Thr | | | |
| 290 | 295 | 300 | |
| cac tct tgg atc ccc aag agg aac cgg tcc ata ttg aac aca agt caa | | | 961 |
| His Ser Trp Ile Pro Lys Arg Asn Arg Ser Ile Leu Asn Thr Ser Gln | | | |
| 305 | 310 | 315 | |
| agg gga ata ctc gaa gat gag cag atg tat cag aaa tgc tgc aac ctg | | | 1009 |
| Arg Gly Ile Leu Glu Asp Glu Gln Met Tyr Gln Cys Cys Asn Leu | | | |
| 320 | 325 | 330 | |
| ttt gaa aaa ttc ttc ccc agc agc tca tac aga aga cca gtc gga att | | | 1057 |
| Phe Glu Lys Phe Phe Pro Ser Ser Tyr Arg Arg Pro Val Gly Ile | | | |
| 335 | 340 | 345 | 350 |
| tct agt atg gtt gag gcc atg gtg tcc agg gcc cgc att gat gca cga | | | 1105 |
| Ser Ser Met Val Glu Ala Met Val Ser Arg Ala Arg Ile Asp Ala Arg | | | |
| 355 | 360 | 365 | |
| att gac ttc gaa tct gga cggtata aag aag gat gag ttc gct gag atc | | | 1153 |
| Ile Asp Phe Glu Ser Gly Arg Ile Lys Lys Asp Glu Phe Ala Glu Ile | | | |
| 370 | 375 | 380 | |
| atg aag atc tgt tcc acc att gaa gag ctc aga cgg caa aaa | | | 1195 |
| Met Lys Ile Cys Ser Thr Ile Glu Leu Arg Arg Gln Lys | | | |
| 385 | 390 | 395 | |
| tagtgaattt agcttgatct tcgtaaaaaa atgccttgtt tctact | | | 1241 |

<210> 95
<211> 396
<212> PRT
<213> Equine influenza virus H3N8

<400> 95

Met Lys Leu Arg Thr Gln Ile Pro Ala Glu Met Leu Ala Ser Ile Asp
1 5 10 15

Leu Lys Tyr Phe Asn Asp Ser Thr Lys Lys Lys Ile Glu Lys Ile Arg
20 25 30

Pro Leu Leu Val Asp Gly Thr Ala Ser Leu Ser Pro Gly Met Met Met
35 40 45

Gly Met Phe Asn Met Leu Ser Thr Val Leu Gly Val Ser Ile Leu Asn
50 55 60

EQ-1-C2-1.ST25.txt

Leu Gly Gln Arg Lys Tyr Thr Lys Thr Tyr Trp Trp Asp Gly Leu
65 70 75 80

Gln Ser Ser Asp Asp Phe Ala Leu Ile Val Asn Ala Pro Asn His Glu
85 90 95

Gly Ile Gln Ala Gly Val Asp Arg Phe Tyr Arg Thr Cys Lys Leu Val
100 105 110

Gly Ile Asn Met Ser Lys Lys Ser Tyr Ile Asn Arg Thr Gly Thr
115 120 125

Phe Glu Phe Thr Ser Phe Phe Tyr Arg Tyr Gly Phe Val Ala Asn Phe
130 135 140

Ser Met Glu Leu Pro Ser Phe Gly Val Ser Gly Ile Asn Glu Ser Ala
145 150 155 160

Asp Met Ser Ile Gly Met Thr Val Ile Lys Asn Asn Met Ile Asn Asn
165 170 175

Asp Leu Gly Pro Ala Thr Ala Gln Met Ala Leu Gln Leu Phe Ile Lys
180 185 190

Asp Tyr Arg Tyr Thr Tyr Arg Cys Gln Arg Gly Asp Thr Gln Ile Gln
195 200 205

Thr Arg Arg Ser Phe Glu Leu Lys Lys Leu Trp Glu Gln Thr Arg Ser
210 215 220

Lys Thr Gly Leu Leu Val Ser Asp Gly Gly Pro Asn Leu Tyr Asn Ile
225 230 235 240

Arg Asn Leu His Ile Pro Glu Val Cys Leu Lys Trp Glu Leu Met Asp
245 250 255

Glu Asp Tyr Lys Gly Arg Leu Cys Asn Pro Leu Asn Pro Phe Val Ser
260 265 270

His Lys Glu Ile Glu Ser Val Asn Ser Ala Val Val Met Pro Ala His
275 280 285

Gly Pro Ala Lys Ser Met Glu Tyr Asp Ala Val Ala Thr Thr His Ser

EQ-1-C2-1.ST25.txt

290

295

300

Trp Ile Pro Lys Arg Asn Arg Ser Ile Leu Asn Thr Ser Gln Arg Gly
 305 310 315 320

Ile Leu Glu Asp Glu Gln Met Tyr Gln Lys Cys Cys Asn Leu Phe Glu
 325 330 335

Lys Phe Phe Pro Ser Ser Tyr Arg Arg Pro Val Gly Ile Ser Ser
 340 345 350

Met Val Glu Ala Met Val Ser Arg Ala Arg Ile Asp Ala Arg Ile Asp
 355 360 365

Phe Glu Ser Gly Arg Ile Lys Lys Asp Glu Phe Ala Glu Ile Met Lys
 370 375 380

Ile Cys Ser Thr Ile Glu Glu Leu Arg Arg Gln Lys
 385 390 395

<210> 96
<211> 1188
<212> DNA
<213> Equine influenza virus H3N8

| | | | | | | |
|-------------|------------------------|-------------|-------------|-------------|------------|-----|
| <400> 96 | | | | | | |
| atgaaaattga | gaactcaa at accaggagaa | atgctcgcaa | gcattgtatct | gaaatatttc | 60 | |
| aatgattcaa | caaaaaagaa | aattgagaag | atacgaccac | ttctggtcga | tgggactgct | 120 |
| tcactgagtc | ctggcatgat | gatggaaatg | ttcaacatgt | tgagcactgt | actaggtgta | 180 |
| tccatattaa | acctggcca | gaggaaatac | acaaagacca | catactggtg | ggatggctcg | 240 |
| caatcatccg | atgattttgc | tttgatagt | aatgcgccta | atcatgaagg | aatacaggct | 300 |
| ggagtagaca | gattctata | gacttgcaaa | ctggtcggga | tcaacatgag | caaaaagaag | 360 |
| tcctacataa | atagaaccgg | cacattcgaa | ttcacaagct | tttctaccg | gtatggttt | 420 |
| gtcgccaaatt | tcagcatgga | gctacccagt | tttggggttt | ccgggataaa | tgaatctgca | 480 |
| gacatgagca | ttggaatgac | agttatcaaa | aacaacatga | taaataatga | tctcggtccc | 540 |
| gccacggcac | aaatggcact | ccaaactcttc | attaaggatt | atcggtacac | ataccggtgt | 600 |
| caaagaggcg | atacccagat | acaaaccaga | agatccttg | agttgaagaa | actgtgggaa | 660 |
| cagactcgat | caaagactgg | tctactggta | tcagatgggg | gtccaaacct | atacaacatc | 720 |
| agaaaacctac | acatcccgga | agtctgtttg | aaatgggagc | tgtatggatga | agattataaa | 780 |

EQ-1-C2-1.ST25.txt

| | |
|---|------|
| gggaggctat gtaatccatt gaatccttgc gttagccaca aagaaattga atcagtgaac | 840 |
| agtgcagtag taatgcctgc gcatggccct gccaaaagca tggagtatga tgctgttgca | 900 |
| acaacacact cttggatccc caagaggaac cggtccatat tgaacacacaag tcaaagggga | 960 |
| atactcgaag atgagcagat gtatcagaaa tgctgcaacc tgtttggaaaa attcttcccc | 1020 |
| agcagctcat acagaagacc agtcggaatt tctagtatgg ttgaggccat ggtgtccagg | 1080 |
| gcccgcatcg atgcacgaat tgacttcgaa tctggacgga taaagaagga tgagttcgct | 1140 |
| gagatcatga agatctgttc caccattgaa gagctcagac ggcaaaaaa | 1188 |

<210> 97
<211> 20
<212> DNA
<213> Artificial sequence

<220>
<223> Synthetic Primer

<400> 97
taaatagaac cggcacattc

20

<210> 98
<211> 17
<212> DNA
<213> Artificial sequence

<220>
<223> Synthetic Primer

<400> 98
caaagaaaatt gaatcag

17

<210> 99
<211> 18
<212> DNA
<213> Artificial sequence

<220>
<223> Synthetic Primer

<400> 99
caagcattac tactgcac

18

<210> 100
<211> 19
<212> DNA
<213> Artificial sequence

<220>
<223> Synthetic Primer

EQ-1-C2-1.ST25.txt

| | |
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| <400> 100 agtctgttcc cacagtttc | 19 |
| <210> 101 <211> 20 <212> DNA <213> Artificial sequence | |
| <220> <223> Synthetic Primer | |
| <400> 101 gaattcgaat gtgccggttc | 20 |
| <210> 102 <211> 20 <212> DNA <213> Artificial sequence | |
| <220> <223> Synthetic Primer | |
| <400> 102 aaaacaagga tttttcacg | 20 |
| <210> 103 <211> 2341 <212> DNA <213> Equine influenza virus H3N8 | |
| <220> <221> CDS <222> (25)..(2295) <223> | |
| <220> <221> misc_feature <222> (1489)..(1489) <223> At nucleotide 1489, w = a or t/u At amino acid residue 489, Xaa = Thr or Ser | |
| <400> 103 agcaaaaagca ggcaaactat ttga atg gat gtc aat ccg act cta ctc ttc Met Asp Val Asn Pro Thr Leu Leu Phe 1 5 | 51 |
| tta aag gtg cca gcg caa aat gct ata agc aca aca ttc cct tat act Leu Lys Val Pro Ala Gln Asn Ala Ile Ser Thr Thr Phe Pro Tyr Thr 10 15 20 25 | 99 |
| gga gat cct ccc tac agt cat gga aca ggg aca gga tac acc atg gat Gly Asp Pro Pro Tyr Ser His Gly Thr Gly Thr Gly Tyr Thr Met Asp 30 35 40 | 147 |

EQ-1-C2-1.ST25.txt

| | |
|---|-----|
| act gtc aac aga aca cat caa tac tca gaa aag ggg aaa tgg aca aca Thr Val Asn Arg Thr His Gln Tyr Ser Glu Lys Gly Lys Trp Thr Thr 45 50 55 | 195 |
| aac act gag att gga gca cca caa ctt aat cca atc gat gga ccg ctt Asn Thr Glu Ile Gly Ala Pro Gln Leu Asn Pro Ile Asp Gly Pro Leu 60 65 70 | 243 |
| cct gaa gac aat gaa cca agt ggg tac gcc caa aca gat tgt gta ttg Pro Glu Asp Asn Glu Pro Ser Gly Tyr Ala Gln Thr Asp Cys Val Leu 75 80 85 | 291 |
| gaa gca atg gct ttc ctt gaa gaa tcc cat ccc gga atc ttt gaa aat Glu Ala Met Ala Phe Leu Glu Ser His Pro Gly Ile Phe Glu Asn 90 95 100 105 | 339 |
| tcg tgt ctt gaa aca atg gag gtg gtt cag cag aca aga gtg gac aaa Ser Cys Leu Glu Thr Met Glu Val Val Gln Gln Thr Arg Val Asp Lys 110 115 120 | 387 |
| cta aca caa ggc cga caa act tac gat tgg acc ttg aat agg aat caa Leu Thr Gln Gly Arg Gln Thr Tyr Asp Trp Thr Leu Asn Arg Asn Gln 125 130 135 | 435 |
| cct gcc gca aca gca ctt gct aat aca att gaa gtg ttc aga tca aat Pro Ala Ala Thr Ala Leu Ala Asn Thr Ile Glu Val Phe Arg Ser Asn 140 145 150 | 483 |
| gat ctg act tcc agt gag tca ggg aga tta atg gac ttc ctc aaa gat Asp Leu Thr Ser Ser Glu Ser Gly Arg Leu Met Asp Phe Leu Lys Asp 155 160 165 | 531 |
| gtc atg gag tcc atg aac aag gaa gaa atg gaa ata aca aca cac ttc Val Met Glu Ser Met Asn Lys Glu Glu Met Glu Ile Thr Thr His Phe 170 175 180 185 | 579 |
| caa cgg aag aga aga gta aga gac aac atg aca aag aga atg gtg aca Gln Arg Lys Arg Arg Val Arg Asp Asn Met Thr Lys Arg Met Val Thr 190 195 200 | 627 |
| cag aga acc ata ggg aag aaa aaa caa cga tta aac aga aag agc tat Gln Arg Thr Ile Gly Lys Lys Gln Arg Leu Asn Arg Lys Ser Tyr 205 210 215 | 675 |
| ctg atc agg gca tta acc tta aac aca atg acc aag gac gct gag aga Leu Ile Arg Ala Leu Thr Leu Asn Thr Met Thr Lys Asp Ala Glu Arg 220 225 230 | 723 |
| ggg aaa ttg aaa cga cga gca att gca acc cca gga atg cag ata aga Gly Lys Leu Lys Arg Arg Ala Ile Ala Thr Pro Gly Met Gln Ile Arg 235 240 245 | 771 |
| ggg ttt gta tat ttt gtt gaa aca tta gcc cga aga ata tgt gaa aag Gly Phe Val Tyr Phe Val Glu Thr Leu Ala Arg Arg Ile Cys Glu Lys 250 255 260 265 | 819 |
| ctt gaa caa tca gga ttg cca gtt ggc ggt aat gag aaa aag gcc aaa Leu Glu Gln Ser Gly Leu Pro Val Gly Gly Asn Glu Lys Lys Ala Lys 270 275 280 | 867 |

EQ-1-C2-1.ST25.txt

| | |
|---|------|
| ctg gct aat gtc gtc aga aaa atg atg act aat tcc caa gac act gaa Leu Ala Asn Val Val Arg Lys Met Met Thr Asn Ser Gln Asp Thr Glu 285 290 295 | 915 |
| ctc tcc ttc acc atc act ggg gac aat acc aaa tgg aat gaa aat cag Leu Ser Phe Thr Ile Thr Gly Asp Asn Thr Lys Trp Asn Glu Asn Gln 300 305 310 | 963 |
| aac cca cgc atg ttc ctg gca atg atc aca tac ata act aga aac cag Asn Pro Arg Met Phe Leu Ala Met Ile Thr Tyr Ile Thr Arg Asn Gln 315 320 325 | 1011 |
| cca gaa tgg ttc aga aat gtt cta agc att gca ccg att atg ttc tca Pro Glu Trp Phe Arg Asn Val Leu Ser Ile Ala Pro Ile Met Phe Ser 330 335 340 345 | 1059 |
| aat aaa atg gca aga ctg ggg aaa gga tat atg ttt gaa agc aaa agt Asn Lys Met Ala Arg Leu Gly Lys Gly Tyr Met Phe Glu Ser Lys Ser 350 355 360 | 1107 |
| atg aaa ttg aga actcaa ata cca gca gaa atg ctc gca agc att gat Met Lys Leu Arg Thr Gln Ile Pro Ala Glu Met Leu Ala Ser Ile Asp 365 370 375 | 1155 |
| ctg aaa tat ttc aat gat tca aca aaa aag aaa att gag aag ata cga Leu Lys Tyr Phe Asn Asp Ser Thr Lys Lys Ile Glu Lys Ile Arg 380 385 390 | 1203 |
| cca ctt ctg gtc gat ggg act gct tca ctg agt cct ggc atg atg atg Pro Leu Leu Val Asp Gly Thr Ala Ser Leu Ser Pro Gly Met Met Met 395 400 405 | 1251 |
| gga atg ttc aac atg ttg agc act gta cta ggt gta tcc ata tta aac Gly Met Phe Asn Met Leu Ser Thr Val Leu Gly Val Ser Ile Leu Asn 410 415 420 425 | 1299 |
| ctg ggc cag agg aaa tac aca aag acc aca tac tgg tgg gat ggt ctg Leu Gly Gln Arg Lys Tyr Thr Lys Thr Tyr Trp Trp Asp Gly Leu 430 435 440 | 1347 |
| caa tca tcc gat gat ttt gct ttg ata gtg aat gcg cct aat cat gaa Gln Ser Ser Asp Asp Phe Ala Leu Ile Val Asn Ala Pro Asn His Glu 445 450 455 | 1395 |
| gga ata cag gct gga gta gac aga ttc tat aga act tgc aaa ctg gtc Gly Ile Gln Ala Gly Val Asp Arg Phe Tyr Arg Thr Cys Lys Leu Val 460 465 470 | 1443 |
| ggg atc aac atg agc aaa aag aag tcc tac ata aat aga acc ggc wca Gly Ile Asn Met Ser Lys Lys Ser Tyr Ile Asn Arg Thr Gly Xaa 475 480 485 | 1491 |
| ttc gaa ttc aca agc ttt ttc tac cgg tat ggt ttt gtc gcc aat ttc Phe Glu Phe Thr Ser Phe Phe Tyr Arg Tyr Gly Phe Val Ala Asn Phe 490 495 500 505 | 1539 |
| agc atg gag cta ccc agt ttt ggg gtt tcc ggg ata aat gaa tct gca Ser Met Glu Leu Pro Ser Phe Gly Val Ser Gly Ile Asn Glu Ser Ala | 1587 |

EQ-1-C2-1.ST25.txt

510

515

520

| | |
|---|------|
| gac atg agc att gga atg aca gtt atc aaa aac aac atg ata aat aat Asp Met Ser Ile Gly Met Thr Val Ile Lys Asn Asn Met Ile Asn Asn 525 530 535 | 1635 |
| gat ctc ggt ccc gcc acg gca caa atg gca ctc caa ctc ttc att aag Asp Leu Gly Pro Ala Thr Ala Gln Met Ala Leu Gln Leu Phe Ile Lys 540 545 550 | 1683 |
| gat tat cgg tac aca tac cgg tgc cat aga ggc gat acc cag ata caa Asp Tyr Arg Tyr Thr Tyr Arg Cys His Arg Gly Asp Thr Gln Ile Gln 555 560 565 | 1731 |
| acc aga aga tcc ttt gag ttg aag aaa ctg tgg gaa cag act cga tca Thr Arg Arg Ser Phe Glu Leu Lys Lys Leu Trp Glu Gln Thr Arg Ser 570 575 580 585 | 1779 |
| aag act ggt cta ctg gta tca gat ggg ggt cca aac cta tac aac atc Lys Thr Gly Leu Leu Val Ser Asp Gly Gly Pro Asn Leu Tyr Asn Ile 590 595 600 | 1827 |
| aga aac cta cac atc ccg gaa gtc tgt ttg aaa tgg gag ctg atg gat Arg Asn Leu His Ile Pro Glu Val Cys Leu Lys Trp Glu Leu Met Asp 605 610 615 | 1875 |
| gaa gat tat aaa ggg agg cta tgt aat cca ttg aat cct ttc gtt agc Glu Asp Tyr Lys Gly Arg Leu Cys Asn Pro Leu Asn Pro Phe Val Ser 620 625 630 | 1923 |
| cac aaa gaa att gaa tca gtg aac agt gca gta atg cct gcg cat His Lys Glu Ile Glu Ser Val Asn Ser Ala Val Val Met Pro Ala His 635 640 645 | 1971 |
| ggc cct gcc aaa agc atg gag tat gat gct gtc aca aca cac tct Gly Pro Ala Lys Ser Met Glu Tyr Asp Ala Val Ala Thr Thr His Ser 650 655 660 665 | 2019 |
| tgg atc ccc aag agg aac ccg tcc ata ttg aac aca agt caa agg gga Trp Ile Pro Lys Arg Asn Arg Ser Ile Leu Asn Thr Ser Gln Arg Gly 670 675 680 | 2067 |
| ata ctc gaa gat gag cag atg tat cag aaa tgc tgc aac ctg ttt gaa Ile Leu Glu Asp Glu Gln Met Tyr Gln Lys Cys Cys Asn Leu Phe Glu 685 690 695 | 2115 |
| aaa ttc ttc ccc agc agc tca tac aga aga cca gtc gga att tct agt Lys Phe Phe Pro Ser Ser Ser Tyr Arg Arg Pro Val Gly Ile Ser Ser 700 705 710 | 2163 |
| atg gtt gag gcc atg gtg tcc agg gcc cgcc att gat gca cga att gac Met Val Glu Ala Met Val Ser Arg Ala Arg Ile Asp Ala Arg Ile Asp 715 720 725 | 2211 |
| ttc gaa tct gga ccg ata aag aag gat gag ttc gct gag atc atg aag Phe Glu Ser Gly Arg Ile Lys Lys Asp Glu Phe Ala Glu Ile Met Lys 730 735 740 745 | 2259 |
| atc tgt tcc acc att gaa gag ctc aga ccg caa aaa tagtgaattt | 2305 |

EQ-1-C2-1.ST25.txt

Ile Cys Ser Thr Ile Glu Glu Leu Arg Arg Gln Lys
750 755

agcttgatct tcgtaaaaaa atgccttggtt tctact 2341

<210> 104
<211> 757
<212> PRT
<213> Equine influenza virus H3N8

<220>
<221> misc_feature
<222> (489)..(489)
<223> The 'Xaa' at location 489 stands for Thr or Ser

<400> 104

Met Asp Val Asn Pro Thr Leu Leu Phe Leu Lys Val Pro Ala Gln Asn
1 5 10 15

Ala Ile Ser Thr Thr Phe Pro Tyr Thr Gly Asp Pro Pro Tyr Ser His
20 25 30

Gly Thr Gly Thr Gly Tyr Thr Met Asp Thr Val Asn Arg Thr His Gln
35 40 45

Tyr Ser Glu Lys Gly Lys Trp Thr Thr Asn Thr Glu Ile Gly Ala Pro
50 55 60

Gln Leu Asn Pro Ile Asp Gly Pro Leu Pro Glu Asp Asn Glu Pro Ser
65 70 75 80

Gly Tyr Ala Gln Thr Asp Cys Val Leu Glu Ala Met Ala Phe Leu Glu
85 90 95

Glu Ser His Pro Gly Ile Phe Glu Asn Ser Cys Leu Glu Thr Met Glu
100 105 110

Val Val Gln Gln Thr Arg Val Asp Lys Leu Thr Gln Gly Arg Gln Thr
115 120 125

Tyr Asp Trp Thr Leu Asn Arg Asn Gln Pro Ala Ala Thr Ala Leu Ala
130 135 140

Asn Thr Ile Glu Val Phe Arg Ser Asn Asp Leu Thr Ser Ser Glu Ser
145 150 155 160

Gly Arg Leu Met Asp Phe Leu Lys Asp Val Met Glu Ser Met Asn Lys
Page 116

EQ-1-C2-1.ST25.txt

165

170

175

Glu Glu Met Glu Ile Thr Thr His Phe Gln Arg Lys Arg Arg Val Arg
180 185 190

Asp Asn Met Thr Lys Arg Met Val Thr Gln Arg Thr Ile Gly Lys Lys
195 200 205

Lys Gln Arg Leu Asn Arg Lys Ser Tyr Leu Ile Arg Ala Leu Thr Leu
210 215 220

Asn Thr Met Thr Lys Asp Ala Glu Arg Gly Lys Leu Lys Arg Arg Ala
225 230 235 240

Ile Ala Thr Pro Gly Met Gln Ile Arg Gly Phe Val Tyr Phe Val Glu
245 250 255

Thr Leu Ala Arg Arg Ile Cys Glu Lys Leu Glu Gln Ser Gly Leu Pro
260 265 270

Val Gly Gly Asn Glu Lys Lys Ala Lys Leu Ala Asn Val Val Arg Lys
275 280 285

Met Met Thr Asn Ser Gln Asp Thr Glu Leu Ser Phe Thr Ile Thr Gly
290 295 300

Asp Asn Thr Lys Trp Asn Glu Asn Gln Asn Pro Arg Met Phe Leu Ala
305 310 315 320

Met Ile Thr Tyr Ile Thr Arg Asn Gln Pro Glu Trp Phe Arg Asn Val
325 330 335

Leu Ser Ile Ala Pro Ile Met Phe Ser Asn Lys Met Ala Arg Leu Gly
340 345 350

Lys Gly Tyr Met Phe Glu Ser Lys Ser Met Lys Leu Arg Thr Gln Ile
355 360 365

Pro Ala Glu Met Leu Ala Ser Ile Asp Leu Lys Tyr Phe Asn Asp Ser
370 375 380

Thr Lys Lys Lys Ile Glu Lys Ile Arg Pro Leu Leu Val Asp Gly Thr
385 390 395 400

EQ-1-C2-1.ST25.txt

Ala Ser Leu Ser Pro Gly Met Met Gly Met Phe Asn Met Leu Ser
405 410 415

Thr Val Leu Gly Val Ser Ile Leu Asn Leu Gly Gln Arg Lys Tyr Thr
420 425 430

Lys Thr Thr Tyr Trp Trp Asp Gly Leu Gln Ser Ser Asp Asp Phe Ala
435 440 445

Leu Ile Val Asn Ala Pro Asn His Glu Gly Ile Gln Ala Gly Val Asp
450 455 460

Arg Phe Tyr Arg Thr Cys Lys Leu Val Gly Ile Asn Met Ser Lys Lys
465 470 475 480

Lys Ser Tyr Ile Asn Arg Thr Gly Xaa Phe Glu Phe Thr Ser Phe Phe
485 490 495

Tyr Arg Tyr Gly Phe Val Ala Asn Phe Ser Met Glu Leu Pro Ser Phe
500 505 510

Gly Val Ser Gly Ile Asn Glu Ser Ala Asp Met Ser Ile Gly Met Thr
515 520 525

Val Ile Lys Asn Asn Met Ile Asn Asn Asp Leu Gly Pro Ala Thr Ala
530 535 540

Gln Met Ala Leu Gln Leu Phe Ile Lys Asp Tyr Arg Tyr Thr Tyr Arg
545 550 555 560

Cys His Arg Gly Asp Thr Gln Ile Gln Thr Arg Arg Ser Phe Glu Leu
565 570 575

Lys Lys Leu Trp Glu Gln Thr Arg Ser Lys Thr Gly Leu Leu Val Ser
580 585 590

Asp Gly Gly Pro Asn Leu Tyr Asn Ile Arg Asn Leu His Ile Pro Glu
595 600 605

Val Cys Leu Lys Trp Glu Leu Met Asp Glu Asp Tyr Lys Gly Arg Leu
610 615 620

Cys Asn Pro Leu Asn Pro Phe Val Ser His Lys Glu Ile Glu Ser Val
625 630 635 640

EQ-1-C2-1.ST25.txt

Asn Ser Ala Val Val Met Pro Ala His Gly Pro Ala Lys Ser Met Glu
645 650 655

Tyr Asp Ala Val Ala Thr Thr His Ser Trp Ile Pro Lys Arg Asn Arg
660 665 670

Ser Ile Leu Asn Thr Ser Gln Arg Gly Ile Leu Glu Asp Glu Gln Met
675 680 685

Tyr Gln Lys Cys Cys Asn Leu Phe Glu Lys Phe Phe Pro Ser Ser Ser
690 695 700

Tyr Arg Arg Pro Val Gly Ile Ser Ser Met Val Glu Ala Met Val Ser
705 710 715 720

Arg Ala Arg Ile Asp Ala Arg Ile Asp Phe Glu Ser Gly Arg Ile Lys
725 730 735

Lys Asp Glu Phe Ala Glu Ile Met Lys Ile Cys Ser Thr Ile Glu Glu
740 745 750

Leu Arg Arg Gln Lys
755

<210> 105
<211> 2271
<212> DNA
<213> Equine influenza virus H3N8

<400> 105
atggatgtca atccgactct actcttctta aaggtgccag cgcaaaatgc tataaggcaca 60
acattccctt atactggaga tcctccctac agtcatggaa cagggacagg atacaccatg 120
gatactgtca acagaacaca tcaatactca gaaaagggga aatggacaac aaacactgag 180
attggagcac cacaacttaa tccaatcgat ggaccgcttc ctgaagaccaa tgaaccaagt 240
gggtacgccc aaacagattg tgtattggaa gcaatggctt tccttgaaga atcccatccc 300
ggaatctttg aaaattcgtg tcttgaaaca atggaggtgg ttcagcagac aagagtggac 360
aaactaacac aaggccgaca aacttacgat tggaccttga ataggaatca acctgcccga 420
acagcacttg ctaatacaat tgaagtgttc agatcaaatg atctgacttc cagtgagtca 480
gggagattaa tggacttcct caaagatgtc atggagtcca tgaacaagga agaaatggaa 540
ataacaacac acttccaacg gaagagaaga gtaagagaca acatgacaaa gagaatggtg 600

EQ-1-C2-1.ST25.txt

| | |
|--|------|
| acacagagaa ccataggaa gaaaaaacaa cgattaaaca gaaagagcta tctgatcagg | 660 |
| gcattaacct taaacacaat gaccaaggac gctgagagag ggaaattgaa acgacgagca | 720 |
| attgcaaccc caggaatgca gataagaggg tttgtatatt ttgttcaaac attagcccga | 780 |
| agaatatgtg aaaagcttga acaatcagga ttgccagttg gcggtaatga gaaaaaggcc | 840 |
| aaactggcta atgtcgctag aaaaatgtg actaattccc aagacactga actctcccttc | 900 |
| accatcactg gggacaatac caaatggaat gaaaatcaga acccacgcat gttcctggca | 960 |
| atgatcacat acataactag aaaccagcca gaatggttca gaaatgttct aagcattgca | 1020 |
| ccgattatgt tctcaaataa aatggcaaga ctggggaaag gatatatgtt tgaaagcaaa | 1080 |
| agtatgaaat tgagaactca aataccagca gaaatgctcg caagcattga tctgaaatat | 1140 |
| ttcaatgatt caacaaaaaa gaaaatttag aagatacgac cacttctggc cgatggact | 1200 |
| gcttcactga gtcctggcat gatgatggga atgttcaaca tggtagcac tgtacttaggt | 1260 |
| gtatccatat taaacctggg ccagaggaaa tacacaaaga ccacatactg gtggatgg | 1320 |
| ctgcaatcat ccgatgattt tgcttgata gtgaatgcgc ctaatcatga aggaatacag | 1380 |
| gctggagtag acagattcta tagaacttgc aaactggtcg ggatcaacat gagaaaaag | 1440 |
| aagtccatca taaatagaac cggcwcattc gaattcacaa gcttttcta ccgttatgg | 1500 |
| tttgtcgcca atttcagcat ggagctaccc agtttgggg tttccggat aaatgaatct | 1560 |
| gcagacatga gcattggaat gacagttatc aaaaacaaca tgataaataa tgatctcggt | 1620 |
| ccggccacgg cacaaatggc actccaactc ttcattaagg attatcgta cacataccgg | 1680 |
| tgccatagag gcgataccca gatacaaacc agaagatcct ttgagttgaa gaaactgtgg | 1740 |
| gaacagactc gatcaaagac tggctactg gtatcagatg ggggtccaaa cctatacaac | 1800 |
| atcagaaacc tacacatccc ggaagtctgt ttgaaatggg agctgatgga tgaagattat | 1860 |
| aaagggaggc tatgtaatcc attgaatcct ttcgttagcc acaaagaaat tgaatcagtg | 1920 |
| aacagtgcag tagtaatgcc tgcgcatggc cctgccaaaa gcatggagta tgatgtgtt | 1980 |
| gcaacaacac actcttggat ccccaagagg aaccggtcca tattgaacac aagtcaaagg | 2040 |
| ggaatactcg aagatgagca gatgtatcag aatgctgca acctgtttga aaaattcttc | 2100 |
| cccagcagct catacagaag accagtcgga atttcttagta tggtagggc catgggtgtcc | 2160 |
| aggccccgca ttgatgcacg aattgacttc gaatctggac ggataaagaa ggatgagttc | 2220 |
| gctgagatca tgaagatctg ttccaccatt gaagagctca gacggcaaaa a | 2271 |

<210> 106
<211> 2341

EQ-1-C2-1.ST25.txt

<212> DNA

<213> Equine influenza virus H3N8

<220>

<221> CDS

<222> (25) .. (2295)

<223>

<220>

<221> misc_feature

<222> (2144) .. (21434)

<223> At nucleotide 2144, r = a or g
At amino acid residue 707, Xaa = Arg or Lys

<400> 106

| | |
|---|----|
| agcaaaaagca ggcaaactat ttga atg gat gtc aat ccg act cta ctc ttc | 51 |
| Met Asp Val Asn Pro Thr Leu Leu Phe | |
| 1 | 5 |

| | |
|---|----|
| tta aag gtg cca gcg caa aat gct ata agc aca aca ttc cct tat act | 99 |
| Leu Lys Val Pro Ala Gln Asn Ala Ile Ser Thr Thr Phe Pro Tyr Thr | |
| 10 | 15 |
| 20 | 25 |

| | |
|---|-----|
| gga gat cct ccc tac agt cat gga aca ggg aca gga tac acc atg gat | 147 |
| Gly Asp Pro Pro Tyr Ser His Gly Thr Gly Thr Gly Tyr Thr Met Asp | |
| 30 | 35 |
| 40 | |

| | |
|---|-----|
| act gtc aac aga aca cat caa tac tca gaa aag ggg aaa tgg aca aca | 195 |
| Thr Val Asn Arg Thr His Gln Tyr Ser Glu Lys Gly Lys Trp Thr Thr | |
| 45 | 50 |
| 55 | |

| | |
|---|-----|
| aac act gag att gga gca cca ctt aat cca atc gat gga ccg ctt | 243 |
| Asn Thr Glu Ile Gly Ala Pro Gln Leu Asn Pro Ile Asp Gly Pro Leu | |
| 60 | 65 |
| 70 | |

| | |
|--|-----|
| cct gaa gac aat gaa cca agt ggg tac gcc caa aca gat tgt gta ttg | 291 |
| Pro. Glu Asp Asn Glu Pro Ser Gly Tyr Ala Gln Thr Asp Cys Val Leu | |
| 75 | 80 |
| 85 | |

| | |
|---|-----|
| gaa gca atg gct ttc ctt gaa gaa tcc cat ccc gga atc ttt gaa aat | 339 |
| Glu Ala Met Ala Phe Leu Glu Glu Ser His Pro Gly Ile Phe Glu Asn | |
| 90 | 95 |
| 100 | 105 |

| | |
|---|-----|
| tcg tgt ctt gaa aca atg gag gtg gtt cag cag aca aga gtg gac aaa | 387 |
| Ser Cys Leu Glu Thr Met Glu Val Val Gln Gln Thr Arg Val Asp Lys | |
| 110 | 115 |
| 120 | |

| | |
|---|-----|
| cta aca caa ggc cga caa act tac gat tgg acc ttg aat agg aat caa | 435 |
| Leu Thr Gln Gly Arg Gln Thr Tyr Asp Trp Thr Leu Asn Arg Asn Gln | |
| 125 | 130 |
| 135 | |

| | |
|---|-----|
| cct gcc gca aca gca ctt gct aat aca att gaa gtg ttc aga tca aat | 483 |
| Pro Ala Ala Thr Ala Leu Ala Asn Thr Ile Glu Val Phe Arg Ser Asn | |
| 140 | 145 |
| 150 | |

| | |
|---|-----|
| gat ctg act tcc agt gag tca ggg aga tta atg gac ttc ctc aaa gat | 531 |
| Asp Leu Thr Ser Ser Glu Ser Gly Arg Leu Met Asp Phe Leu Lys Asp | |
| 155 | 160 |
| 165 | |

EQ-1-C2-1.ST25.txt

| | |
|---|------|
| gtc atg gag tcc atg aac aag gaa gaa atg gaa ata aca aca cac ttc Val Met Glu Ser Met Asn Lys Glu Glu Met Glu Ile Thr Thr His Phe 170 175 180 185 | 579 |
| caa cgg aag aga aga gta aga gac aac atg aca aag aga atg gtg aca Gln Arg Lys Arg Arg Val Arg Asp Asn Met Thr Lys Arg Met Val Thr 190 195 200 | 627 |
| cag aga acc ata ggg aag aaa aaa caa cga tta aac aga aag agc tat Gln Arg Thr Ile Gly Lys Lys Gln Arg Leu Asn Arg Lys Ser Tyr 205 210 215 | 675 |
| ctg atc agg gca tta acc tta aac aca atg acc aag gac gct gag aga Leu Ile Arg Ala Leu Thr Leu Asn Thr Met Thr Lys Asp Ala Glu Arg 220 225 230 | 723 |
| ggg aaa ttg aaa cga cga gca att gca acc cca gga atg cag ata aga Gly Lys Leu Lys Arg Arg Ala Ile Ala Thr Pro Gly Met Gln Ile Arg 235 240 245 | 771 |
| ggg ttt gta tat ttt gtt gaa aca tta gcc cga aga ata tgt gaa aag Gly Phe Val Tyr Phe Val Glu Thr Leu Ala Arg Arg Ile Cys Glu Lys 250 255 260 265 | 819 |
| ctt gaa caa tca gga ttg cca gtt ggc ggt aat gag aaa aag gcc aaa Leu Glu Gln Ser Gly Leu Pro Val Gly Gly Asn Glu Lys Lys Ala Lys 270 275 280 | 867 |
| ctg gct aat gtc gtc aga aaa atg atg act aat tcc caa gac act gaa Leu Ala Asn Val Val Arg Lys Met Met Thr Asn Ser Gln Asp Thr Glu 285 290 295 | 915 |
| ctc tcc ttc acc atc act ggg gac aat acc aaa tgg aat gaa aat cag Leu Ser Phe Thr Ile Thr Gly Asp Asn Thr Lys Trp Asn Glu Asn Gln 300 305 310 | 963 |
| aac cca cgc atg ttc ctg gca atg atc aca tac ata act aga aac cag Asn Pro Arg Met Phe Leu Ala Met Ile Thr Tyr Ile Thr Arg Asn Gln 315 320 325 | 1011 |
| cca gaa tgg ttc aga aat gtt cta agc att gca ccg att atg ttc tca Pro Glu Trp Phe Arg Asn Val Leu Ser Ile Ala Pro Ile Met Phe Ser 330 335 340 345 | 1059 |
| aat aaa atg gca aga ctg ggg aaa gga tat atg ttt gaa agc aaa agt Asn Lys Met Ala Arg Leu Gly Lys Gly Tyr Met Phe Glu Ser Lys Ser 350 355 360 | 1107 |
| atg aaa ttg aga act caa ata cca gca gaa atg ctc gca agc att gat Met Lys Leu Arg Thr Gln Ile Pro Ala Glu Met Leu Ala Ser Ile Asp 365 370 375 | 1155 |
| ctg aaa tat ttc aat gat tca aca aaa aag aaa att gag aag ata cga Leu Lys Tyr Phe Asn Asp Ser Thr Lys Lys Lys Ile Glu Lys Ile Arg 380 385 390 | 1203 |
| cca ctt ctg gtc gat ggg act gct tca ctg agt cct ggc atg atg atg Pro Leu Leu Val Asp Gly Thr Ala Ser Leu Ser Pro Gly Met Met Met | 1251 |

EQ-1-C2-1.ST25.txt

395

400

405

| | |
|---|------|
| gga atg ttc aac atg ttg agc act gta cta ggt gta tcc ata tta aac Gly Met Phe Asn Met Leu Ser Thr Val Leu Gly Val Ser Ile Leu Asn 410 415 420 425 | 1299 |
| ctg ggc cag agg aaa tac aca aag acc aca tac tgg tgg gat ggt ctg Leu Gly Gln Arg Lys Tyr Thr Lys Thr Tyr Trp Trp Asp Gly Leu 430 435 440 | 1347 |
| caa tca tcc gat gat ttt gct ttg ata gtg aat gcg cct aat cat gaa Gln Ser Ser Asp Asp Phe Ala Leu Ile Val Asn Ala Pro Asn His Glu 445 450 455 | 1395 |
| gga ata cag gct gga gta gac aga ttc tat aga act tgc aaa ctg gtc Gly Ile Gln Ala Gly Val Asp Arg Phe Tyr Arg Thr Cys Lys Leu Val 460 465 470 | 1443 |
| ggg atc aac atg agc aaa aag aag tcc tac ata aat aga acc ggc aca Gly Ile Asn Met Ser Lys Lys Ser Tyr Ile Asn Arg Thr Gly Thr 475 480 485 | 1491 |
| ttc gaa ttc aca agc ttt ttc tac cgg tat ggt ttt gtc gcc aat ttc Phe Glu Phe Thr Ser Phe Phe Tyr Arg Tyr Gly Phe Val Ala Asn Phe 490 495 500 505 | 1539 |
| agc atg gag cta ccc agt ttt ggg gtt tcc ggg ata aat gaa tct gca Ser Met Glu Leu Pro Ser Phe Gly Val Ser Gly Ile Asn Glu Ser Ala 510 515 520 | 1587 |
| gac atg agc att gga atg aca gtt atc aaa aac aac atg ata aat aat Asp Met Ser Ile Gly Met Thr Val Ile Lys Asn Asn Met Ile Asn Asn 525 530 535 | 1635 |
| gat ctc ggt ccc gcc acg gca caa atg gca ctc caa ctc ttc att aag Asp Leu Gly Pro Ala Thr Ala Gln Met Ala Leu Gln Leu Phe Ile Lys 540 545 550 | 1683 |
| gat tat cgg tac aca tac cgg tgt caa aga ggc gat acc cag ata caa Asp Tyr Arg Tyr Thr Tyr Arg Cys Gln Arg Gly Asp Thr Gln Ile Gln 555 560 565 | 1731 |
| acc aga aga tcc ttt gag ttg aag aaa ctg tgg gaa cag act cga tca Thr Arg Arg Ser Phe Glu Leu Lys Lys Leu Trp Glu Gln Thr Arg Ser 570 575 580 585 | 1779 |
| aag act ggt cta ctg gta tca gat ggg ggt cca aac cta tac aac atc Lys Thr Gly Leu Leu Val Ser Asp Gly Gly Pro Asn Leu Tyr Asn Ile 590 595 600 | 1827 |
| aga aac cta cac atc ccg gaa gtc tgt ttg aaa tgg gag ctg atg gat Arg Asn Leu His Ile Pro Glu Val Cys Leu Lys Trp Glu Leu Met Asp 605 610 615 | 1875 |
| gaa gat tat aaa ggg agg cta tgt aat cca ttg aat cct ttc gtt agc Glu Asp Tyr Lys Gly Arg Leu Cys Asn Pro Leu Asn Pro Phe Val Ser 620 625 630 | 1923 |
| cac aaa gaa att gaa tca gtg aac agt gca gta gta atg cct gcg cat | 1971 |

EQ-1-C2-1.ST25.txt

| | | | |
|--|-----|-----|------|
| His Lys Glu Ile Glu Ser Val Asn Ser Ala Val Val Met Pro Ala His | | | |
| 635 | 640 | 645 | |
| ggc cct gcc aaa agc atg gag tat gat gct gtt gca aca aca cac tct | | | 2019 |
| Gly Pro Ala Lys Ser Met Glu Tyr Asp Ala Val Ala Thr Thr His Ser | | | |
| 650 | 655 | 660 | 665 |
| tgg atc ccc aag agg aac cgg tcc ata ttg aac aca agt caa agg gga | | | 2067 |
| Trp Ile Pro Lys Arg Asn Arg Ser Ile Leu Asn Thr Ser Gln Arg Gly | | | |
| 670 | 675 | 680 | |
| ata ctc gaa gat gag cag atg tat cag aaa tgc tgc aac ctg ttt gaa | | | 2115 |
| Ile Leu Glu Asp Glu Gln Met Tyr Gln Lys Cys Cys Asn Leu Phe Glu | | | |
| 685 | 690 | 695 | |
| aaa ttc ttc ccc agc agc tca tac aga ara cca gtc gga att tct agt | | | 2163 |
| Lys Phe Phe Pro Ser Ser Tyr Arg Xaa Pro Val Gly Ile Ser Ser | | | |
| 700 | 705 | 710 | |
| atg gtt gag gcc atg gtg tcc agg gcc cgcc att gat gca cga att gac | | | 2211 |
| Met Val Glu Ala Met Val Ser Arg Ala Arg Ile Asp Ala Arg Ile Asp | | | |
| 715 | 720 | 725 | |
| ttc gaa tct gga cgg ata aag aag gat gag ttc gct gag atc atg aag | | | 2259 |
| Phe Glu Ser Gly Arg Ile Lys Lys Asp Glu Phe Ala Glu Ile Met Lys | | | |
| 730 | 735 | 740 | 745 |
| atc tgt tcc acc att gaa gag ctc aga cgg caa aaa tagtgaattt | | | 2305 |
| Ile Cys Ser Thr Ile Glu Glu Leu Arg Arg Gln Lys | | | |
| 750 | 755 | | |
| agcttgatct tcgtgaaaaa atgccttgtt tctact | | | 2341 |

<210> 107
 <211> 757
 <212> PRT
 <213> Equine influenza virus H3N8

 <220>
 <221> misc_feature
 <222> (707)..(707)
 <223> The 'Xaa' at location 707 stands for Arg, or Lys.

<400> 107

 Met Asp Val Asn Pro Thr Leu Leu Phe Leu Lys Val Pro Ala Gln Asn
 1 5 10 15

Ala Ile Ser Thr Thr Phe Pro Tyr Thr Gly Asp Pro Pro Tyr Ser His
 20 25 30

Gly Thr Gly Thr Gly Tyr Thr Met Asp Thr Val Asn Arg Thr His Gln
 35 40 45

Tyr Ser Glu Lys Gly Lys Trp Thr Asn Thr Glu Ile Gly Ala Pro
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50

55

60

Gln Leu Asn Pro Ile Asp Gly Pro Leu Pro Glu Asp Asn Glu Pro Ser
65 70 75 80

Gly Tyr Ala Gln Thr Asp Cys Val Leu Glu Ala Met Ala Phe Leu Glu
85 90 95

Glu Ser His Pro Gly Ile Phe Glu Asn Ser Cys Leu Glu Thr Met Glu
100 105 110

Val Val Gln Gln Thr Arg Val Asp Lys Leu Thr Gln Gly Arg Gln Thr
115 120 125

Tyr Asp Trp Thr Leu Asn Arg Asn Gln Pro Ala Ala Thr Ala Leu Ala
130 135 140

Asn Thr Ile Glu Val Phe Arg Ser Asn Asp Leu Thr Ser Ser Glu Ser
145 150 155 160

Gly Arg Leu Met Asp Phe Leu Lys Asp Val Met Glu Ser Met Asn Lys
165 170 175

Glu Glu Met Glu Ile Thr Thr His Phe Gln Arg Lys Arg Arg Val Arg
180 185 190

Asp Asn Met Thr Lys Arg Met Val Thr Gln Arg Thr Ile Gly Lys Lys
195 200 205

Lys Gln Arg Leu Asn Arg Lys Ser Tyr Leu Ile Arg Ala Leu Thr Leu
210 215 220

Asn Thr Met Thr Lys Asp Ala Glu Arg Gly Lys Leu Lys Arg Arg Ala
225 230 235 240

Ile Ala Thr Pro Gly Met Gln Ile Arg Gly Phe Val Tyr Phe Val Glu
245 250 255

Thr Leu Ala Arg Arg Ile Cys Glu Lys Leu Glu Gln Ser Gly Leu Pro
260 265 270

Val Gly Gly Asn Glu Lys Lys Ala Lys Leu Ala Asn Val Val Arg Lys
275 280 285

EQ-1-C2-1.ST25.txt

Met Met Thr Asn Ser Gln Asp Thr Glu Leu Ser Phe Thr Ile Thr Gly
290 295 300

Asp Asn Thr Lys Trp Asn Glu Asn Gln Asn Pro Arg Met Phe Leu Ala
305 310 315 320

Met Ile Thr Tyr Ile Thr Arg Asn Gln Pro Glu Trp Phe Arg Asn Val
325 330 335

Leu Ser Ile Ala Pro Ile Met Phe Ser Asn Lys Met Ala Arg Leu Gly
340 345 350

Lys Gly Tyr Met Phe Glu Ser Lys Ser Met Lys Leu Arg Thr Gln Ile
355 360 365

Pro Ala Glu Met Leu Ala Ser Ile Asp Leu Lys Tyr Phe Asn Asp Ser
370 375 380

Thr Lys Lys Lys Ile Glu Lys Ile Arg Pro Leu Leu Val Asp Gly Thr
385 390 395 400

Ala Ser Leu Ser Pro Gly Met Met Gly Met Phe Asn Met Leu Ser
405 410 415

Thr Val Leu Gly Val Ser Ile Leu Asn Leu Gly Gln Arg Lys Tyr Thr
420 425 430

Lys Thr Thr Tyr Trp Trp Asp Gly Leu Gln Ser Ser Asp Asp Phe Ala
435 440 445

Leu Ile Val Asn Ala Pro Asn His Glu Gly Ile Gln Ala Gly Val Asp
450 455 460

Arg Phe Tyr Arg Thr Cys Lys Leu Val Gly Ile Asn Met Ser Lys Lys
465 470 475 480

Lys Ser Tyr Ile Asn Arg Thr Gly Thr Phe Glu Phe Thr Ser Phe Phe
485 490 495

Tyr Arg Tyr Gly Phe Val Ala Asn Phe Ser Met Glu Leu Pro Ser Phe
500 505 510

Gly Val Ser Gly Ile Asn Glu Ser Ala Asp Met Ser Ile Gly Met Thr
515 520 525

EQ-1-C2-1.ST25.txt

Val Ile Lys Asn Asn Met Ile Asn Asn Asp Leu Gly Pro Ala Thr Ala
530 535 540

Gln Met Ala Leu Gln Leu Phe Ile Lys Asp Tyr Arg Tyr Thr Tyr Arg
545 550 555 560

Cys Gln Arg Gly Asp Thr Gln Ile Gln Thr Arg Arg Ser Phe Glu Leu
565 570 575

Lys Lys Leu Trp Glu Gln Thr Arg Ser Lys Thr Gly Leu Leu Val Ser
580 585 590

Asp Gly Gly Pro Asn Leu Tyr Asn Ile Arg Asn Leu His Ile Pro Glu
595 600 605

Val Cys Leu Lys Trp Glu Leu Met Asp Glu Asp Tyr Lys Gly Arg Leu
610 615 620

Cys Asn Pro Leu Asn Pro Phe Val Ser His Lys Glu Ile Glu Ser Val
625 630 635 640

Asn Ser Ala Val Val Met Pro Ala His Gly Pro Ala Lys Ser Met Glu
645 650 655

Tyr Asp Ala Val Ala Thr Thr His Ser Trp Ile Pro Lys Arg Asn Arg
660 665 670

Ser Ile Leu Asn Thr Ser Gln Arg Gly Ile Leu Glu Asp Glu Gln Met
675 680 685

Tyr Gln Lys Cys Cys Asn Leu Phe Glu Lys Phe Phe Pro Ser Ser Ser
690 695 700

Tyr Arg Xaa Pro Val Gly Ile Ser Ser Met Val Glu Ala Met Val Ser
705 710 715 720

Arg Ala Arg Ile Asp Ala Arg Ile Asp Phe Glu Ser Gly Arg Ile Lys
725 730 735

Lys Asp Glu Phe Ala Glu Ile Met Lys Ile Cys Ser Thr Ile Glu Glu
740 745 750

Leu Arg Arg Gln Lys
755

EQ-1-C2-1.ST25.txt

<210> 108
 <211> 2271
 <212> DNA
 <213> Equine influenza virus H3N8

| | |
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| <400> 108 | |
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| acattccctt atactggaga tcctccctac agtcatggaa cagggacagg atacaccatg | 120 |
| gatactgtca acagaacaca tcaatactca gaaaagggga aatggacaac aaacactgag | 180 |
| attggagcac cacaacttaa tccaatcgat ggaccgcttc ctgaagacaa tgaaccaagt | 240 |
| gggtacgccc aaacagattg tgtattggaa gcaatggctt tccttgaaga atcccattccc | 300 |
| ggaatcttg aaaattcgtg tcttcaaaca atggaggtgg ttcagcagac aagagtggac | 360 |
| aaactaacac aaggccgaca aacttacgat tggaccttga ataggaatca acctgccgca | 420 |
| acagcacttg ctaatacaat tgaagtgttc agatcaaatg atctgacttc cagtgagtca | 480 |
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| gcattaacct taaacacaat gaccaaggac gctgagagag gggaaattgaa acgacgagca | 720 |
| attgcaaccc caggaatgca gataagaggg tttgtatatt ttgttcaaacc attagccccga | 780 |
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| accatcactg gggacaatac caaatggaaat gaaaatcaga acccacgcat gttcctggca | 960 |
| atgatcacat acataactag aaaccagcca gaatggttca gaaatgttct aagcattgca | 1020 |
| ccgattatgt tctcaaataa aatggcaaga ctggggaaag gatatatgtt tgaaagcaaa | 1080 |
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EQ-1-C2-1.ST25.txt

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| tgtcaaagag gcgataccca gatacaaacc agaagatcct ttgagttgaa gaaactgtgg | 1740 |
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